

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

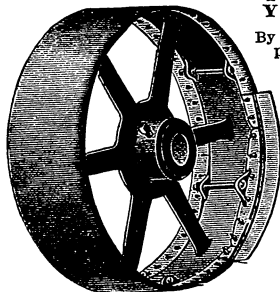
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Reading Matter Contents.....page 1144
Classified List of Advertisers.... " 107
Alphabetical Index to Advertisers " 111
Advertising and Subscription Rates " 1151

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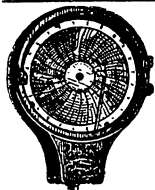
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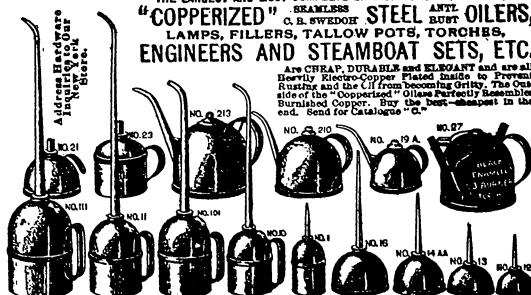
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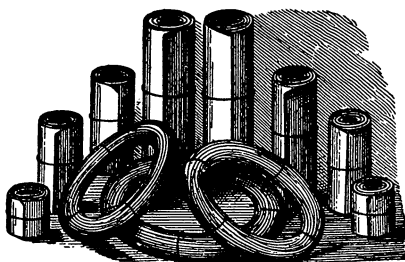
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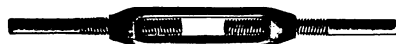
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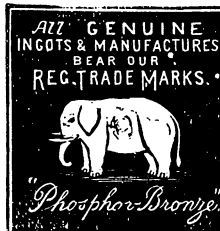
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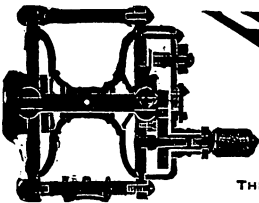
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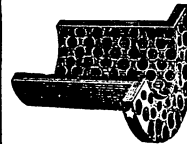
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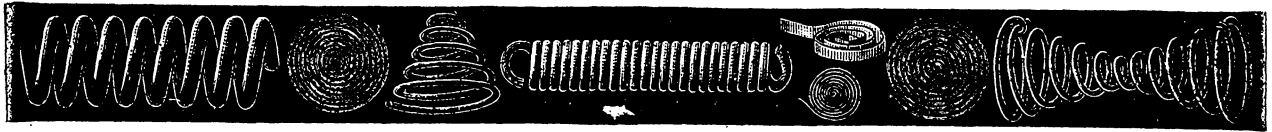
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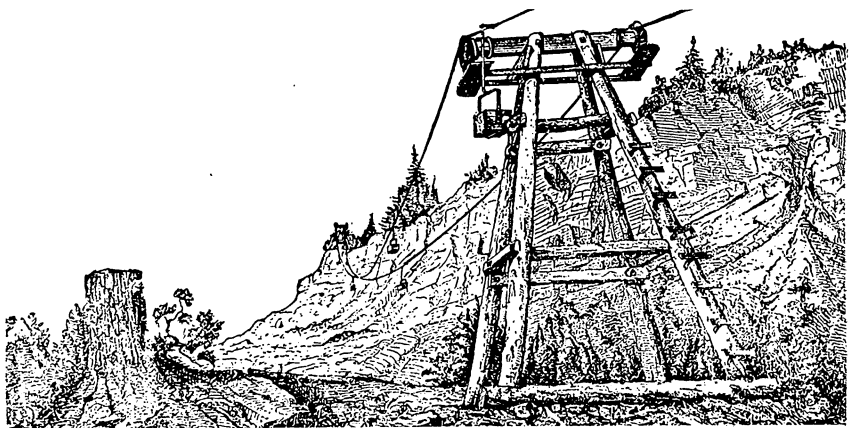
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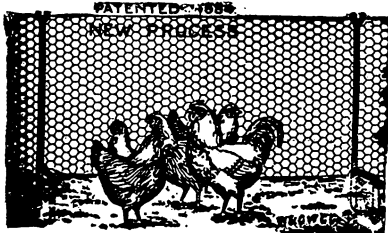
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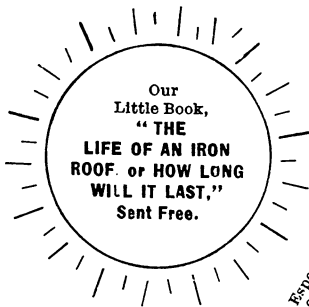
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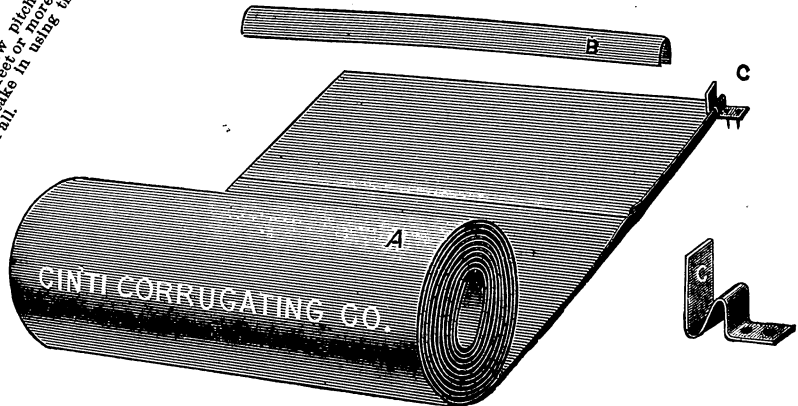
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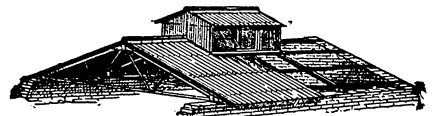
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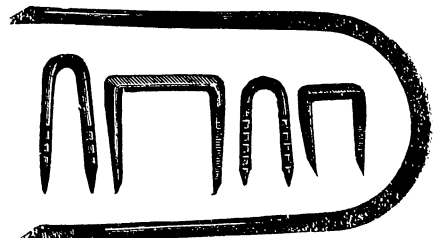
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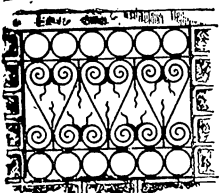
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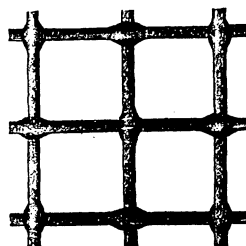
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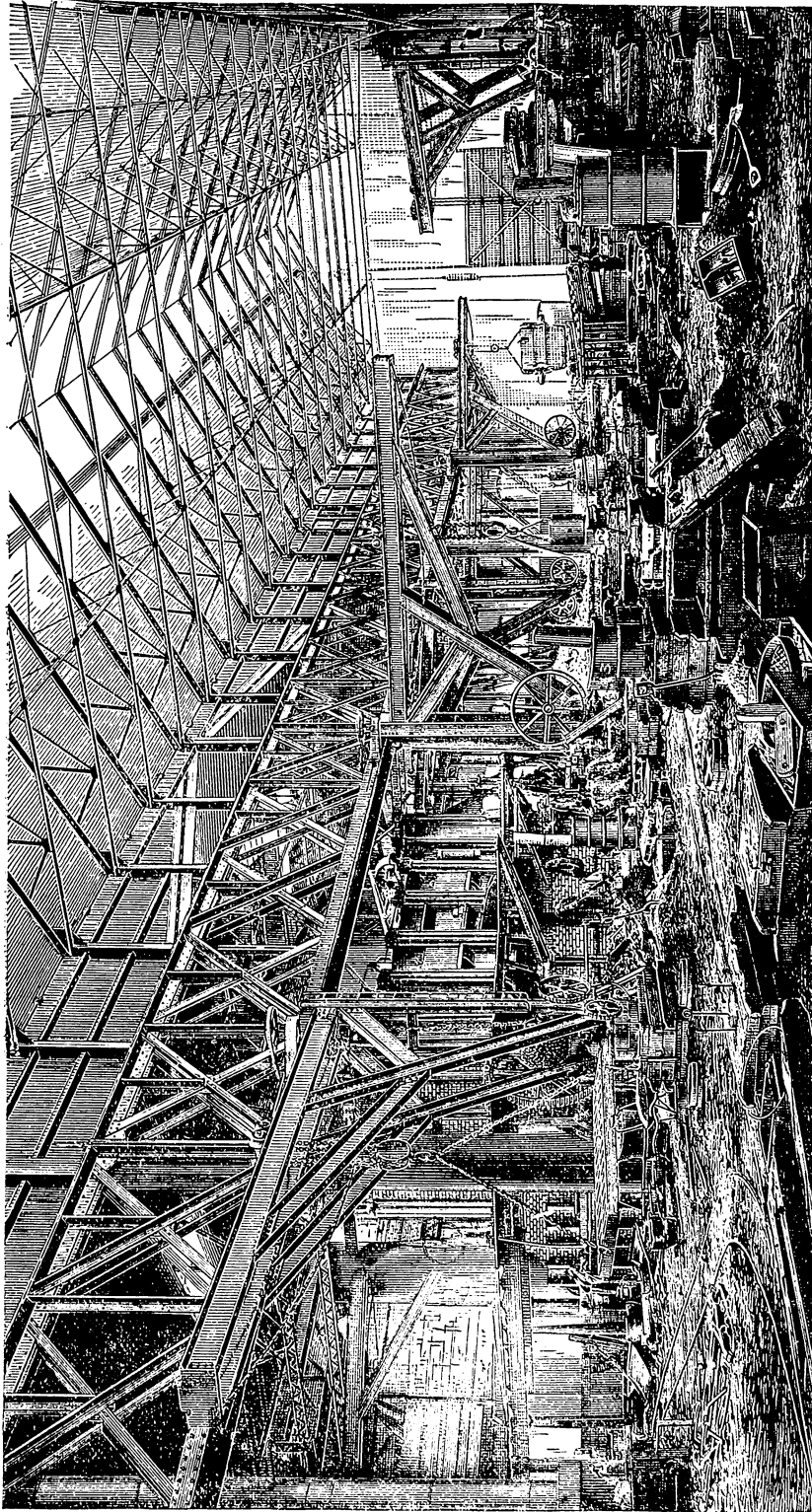
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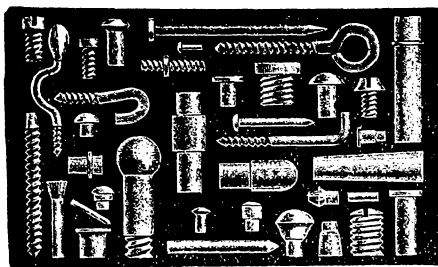
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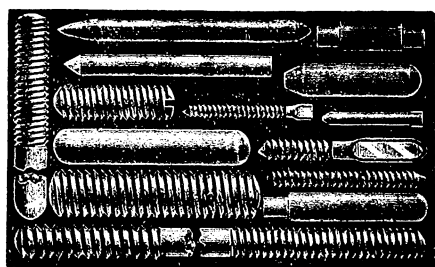
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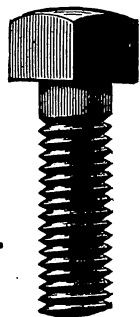
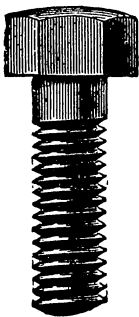
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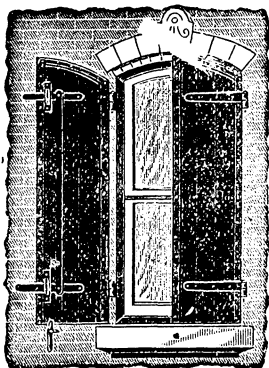
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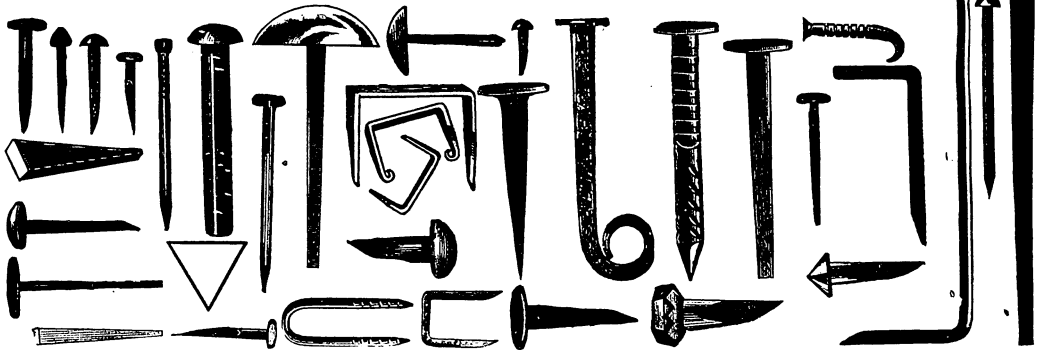
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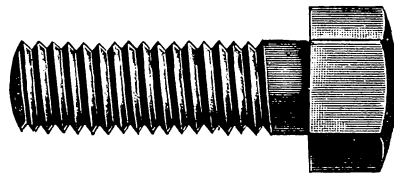


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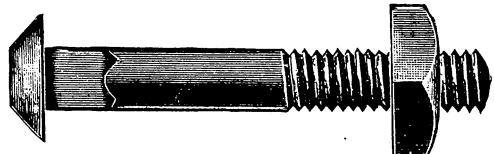
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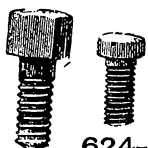
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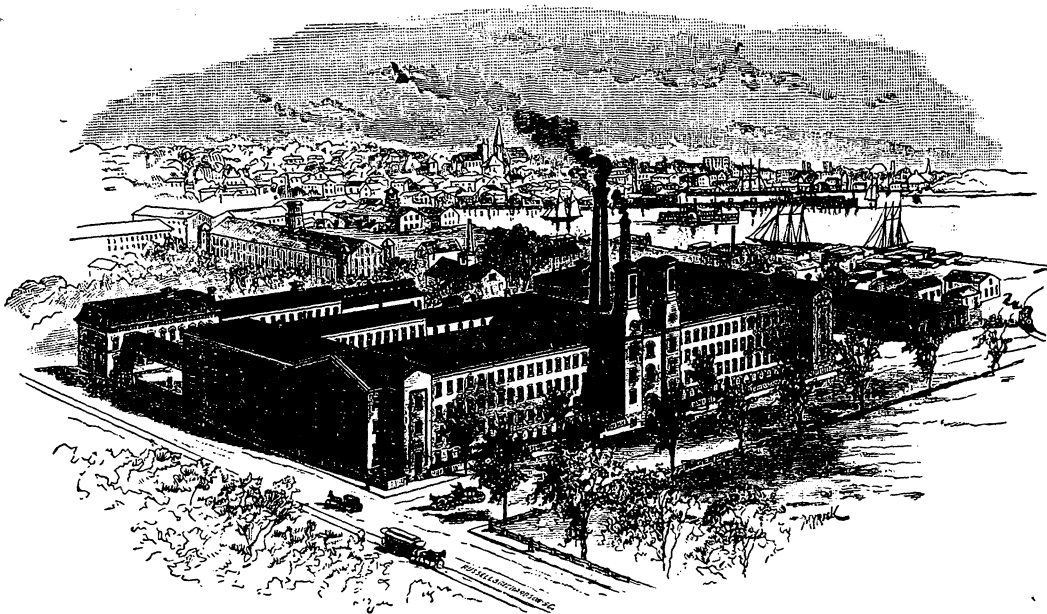
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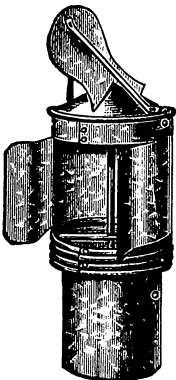
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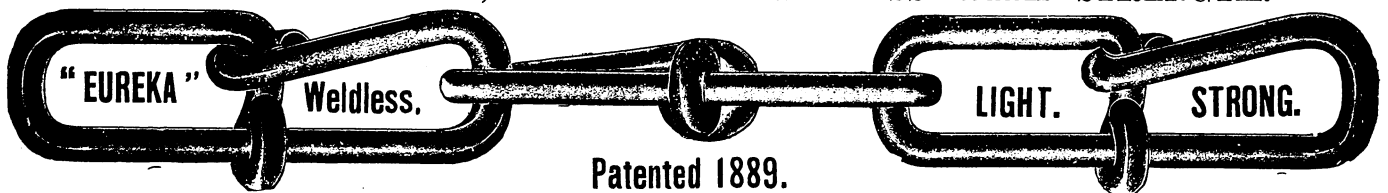
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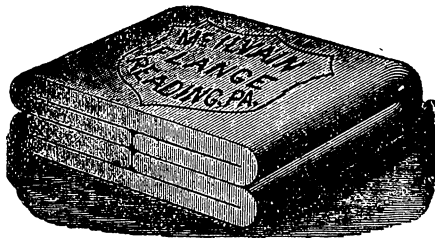
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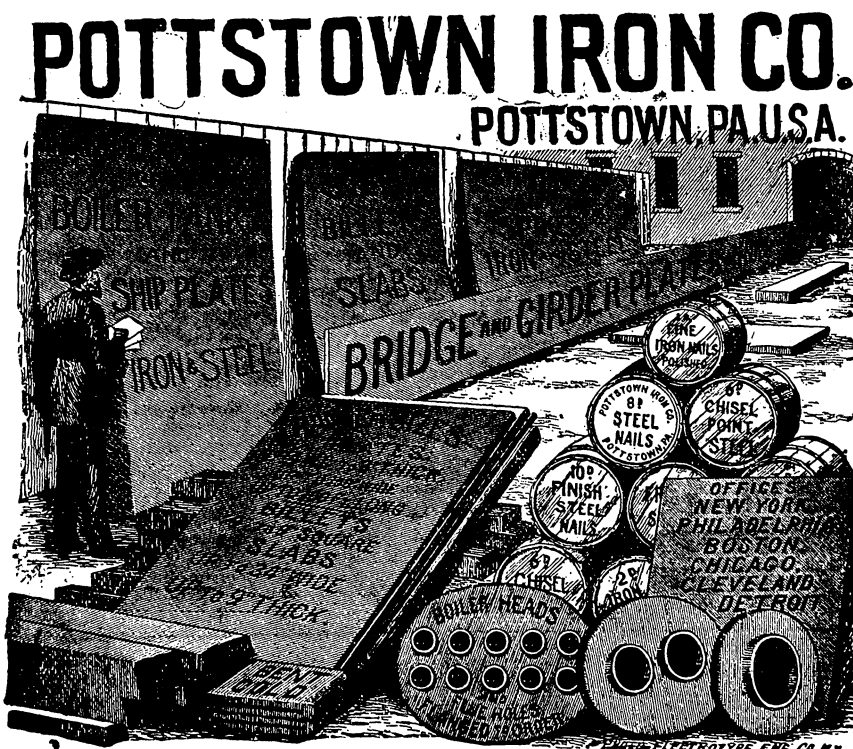
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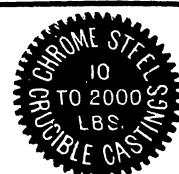
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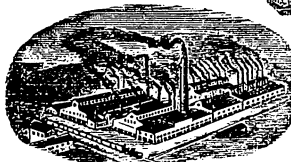
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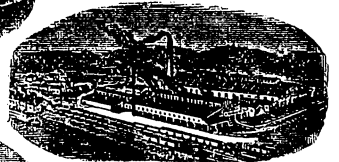
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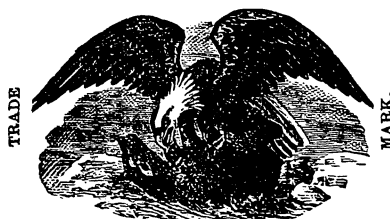
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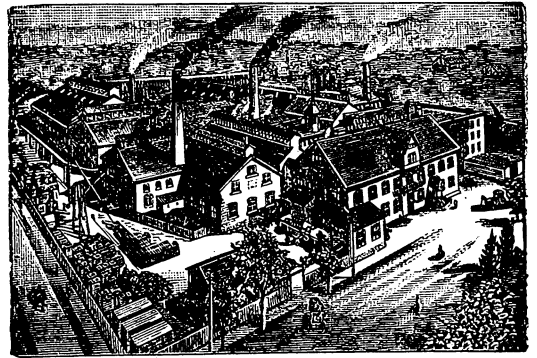
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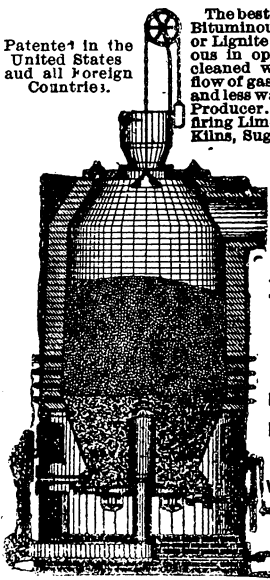


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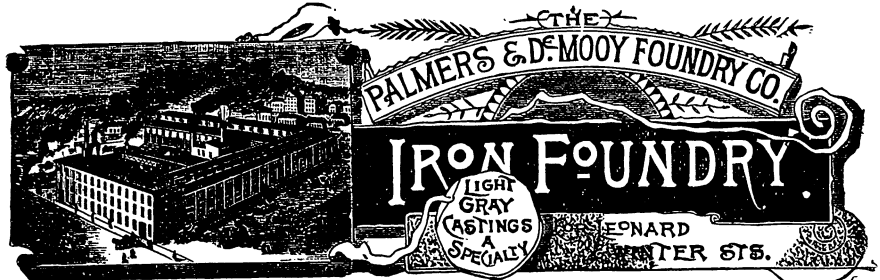
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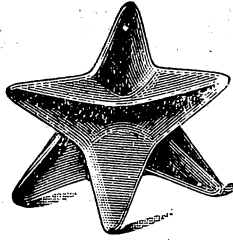
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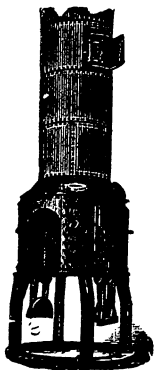
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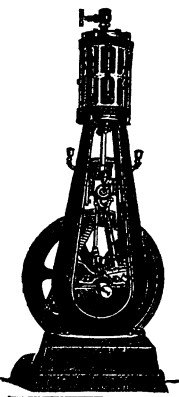
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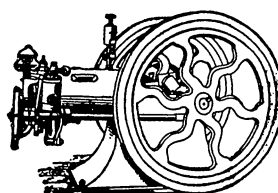
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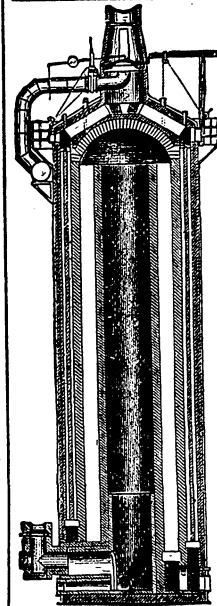
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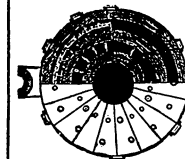
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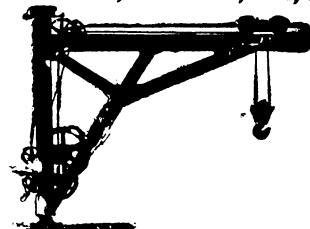


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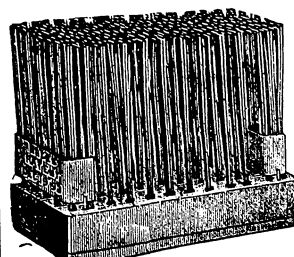
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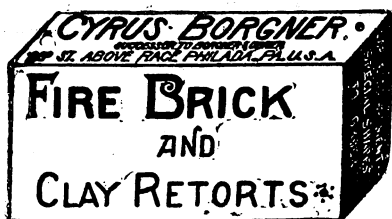
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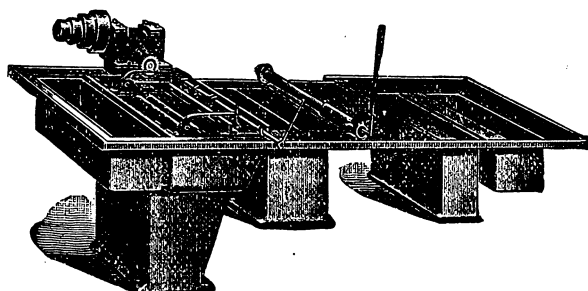
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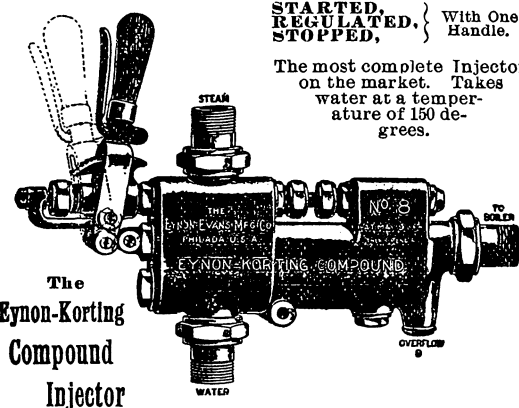
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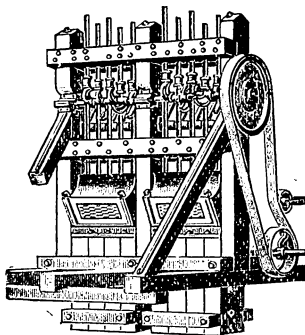
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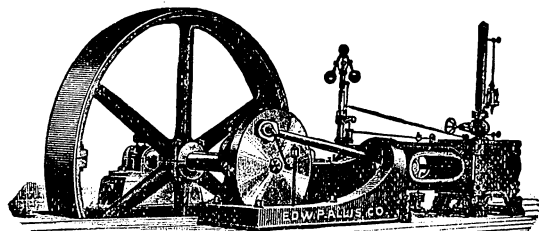
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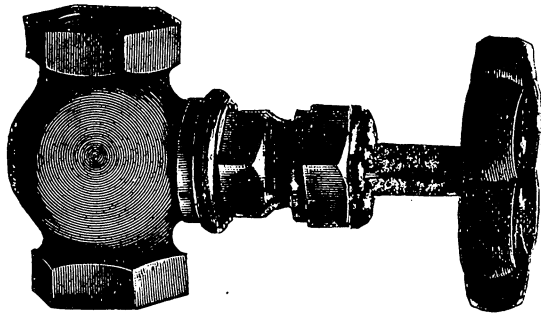
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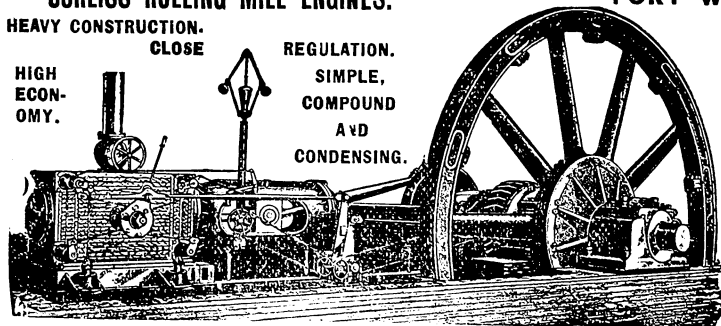
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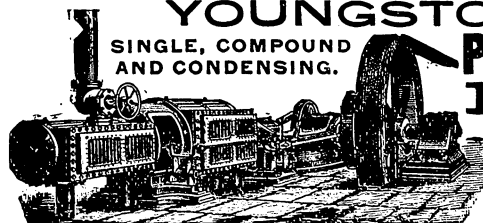
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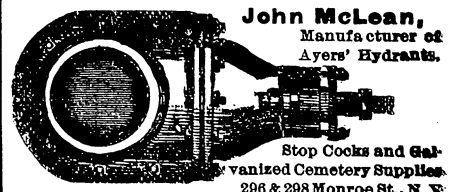
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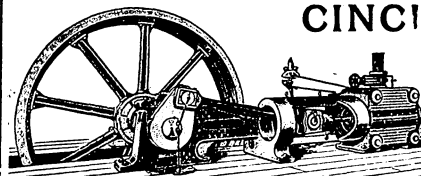
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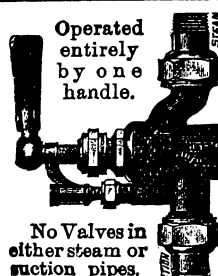
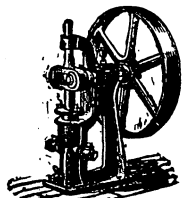
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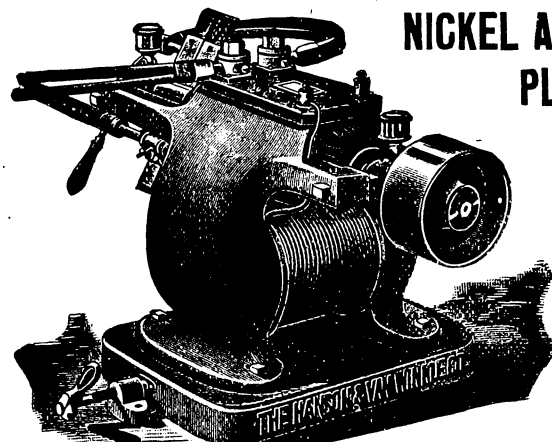
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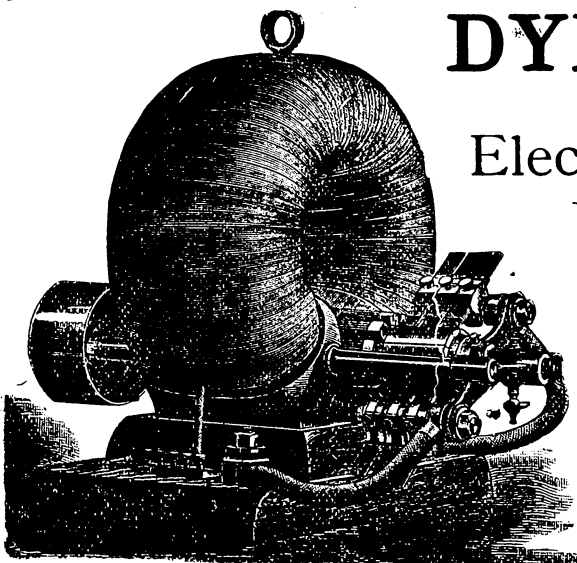
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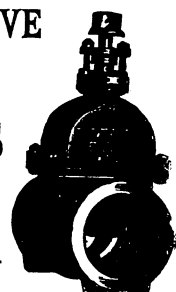
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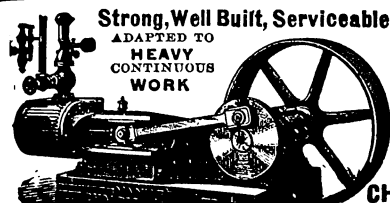
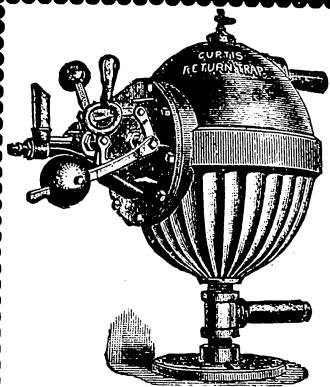
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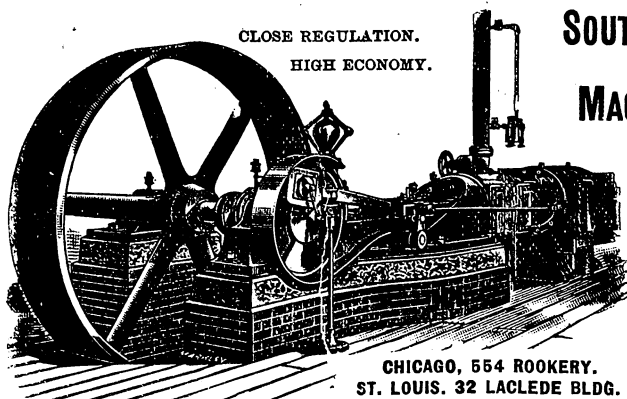
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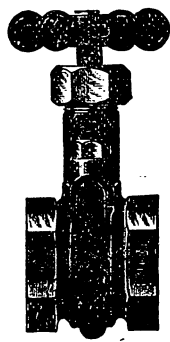
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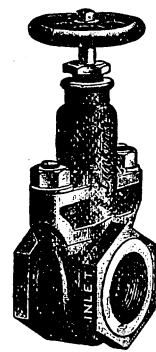
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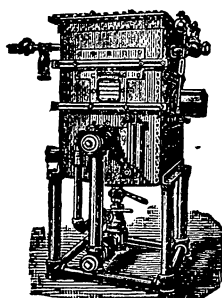
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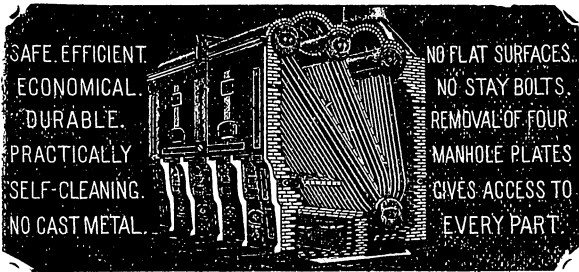
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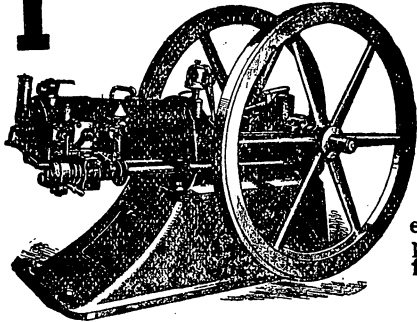


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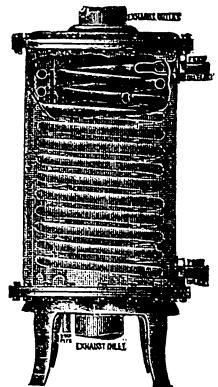
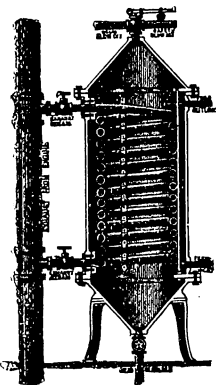
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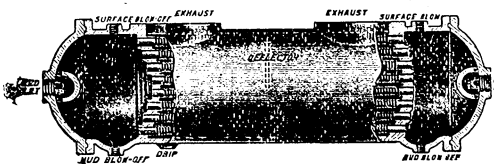
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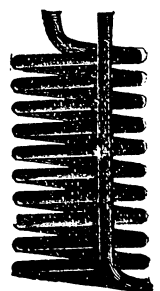
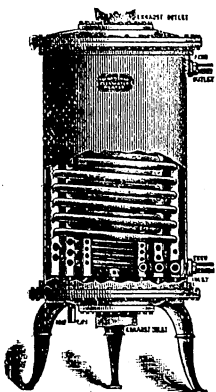
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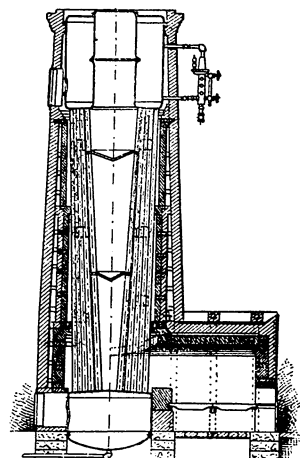
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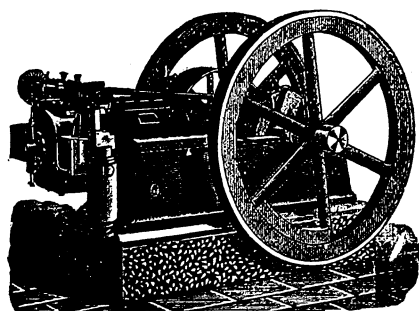
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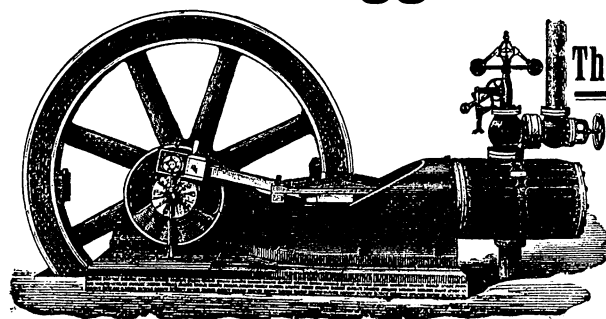
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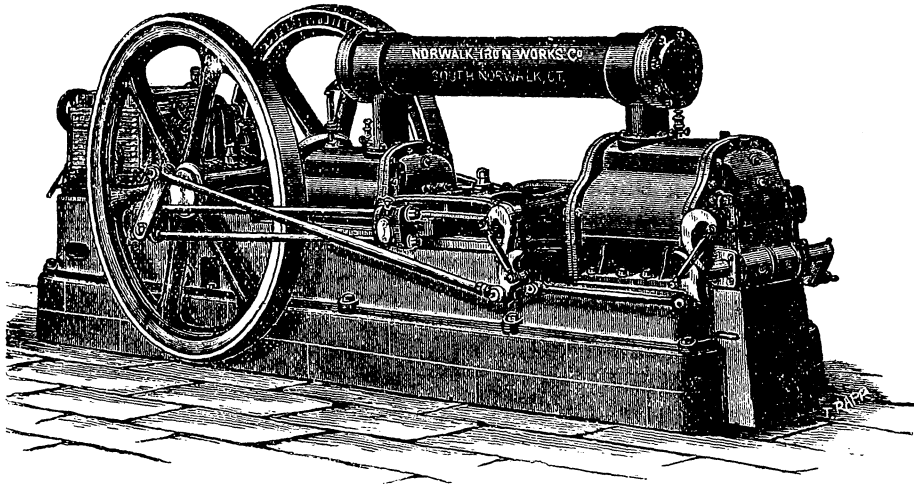
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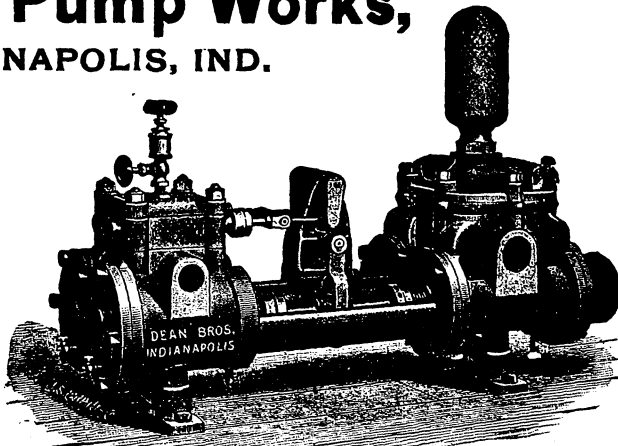
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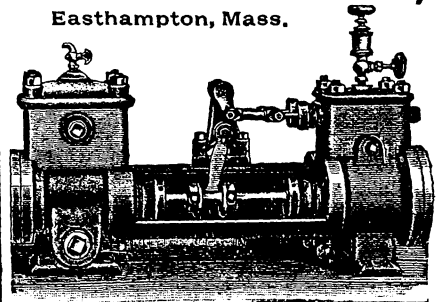
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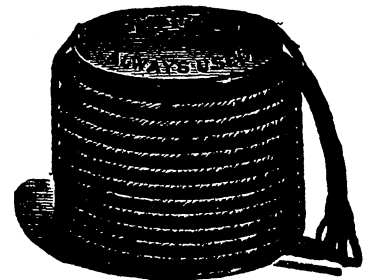
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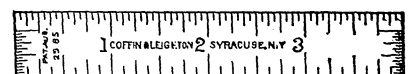
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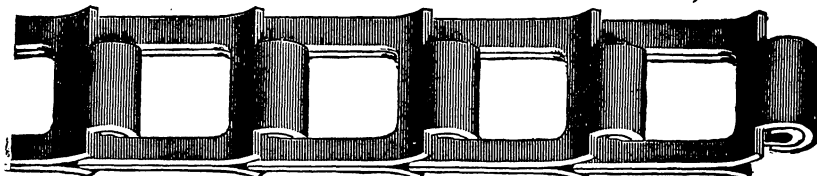
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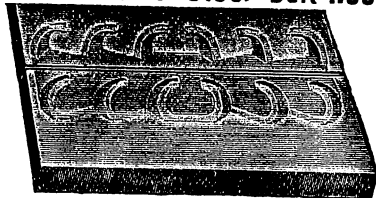
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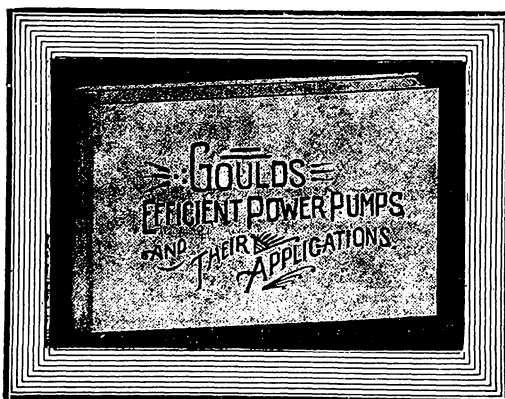
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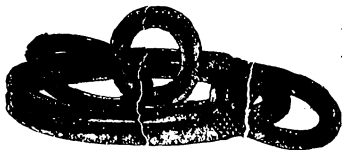
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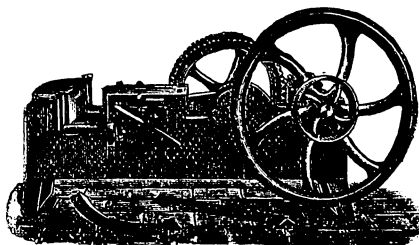
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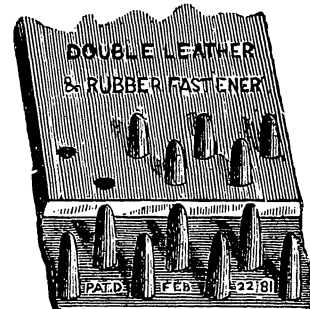
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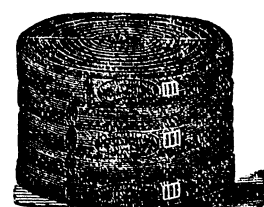


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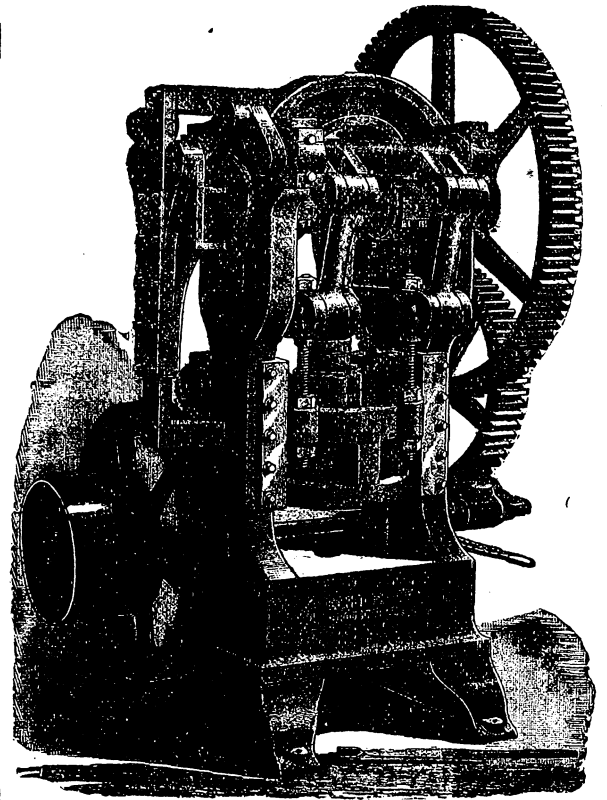
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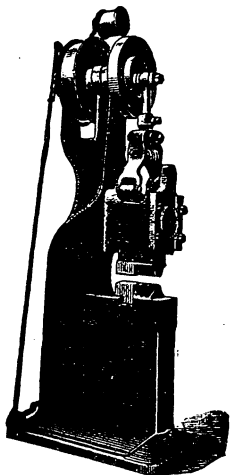
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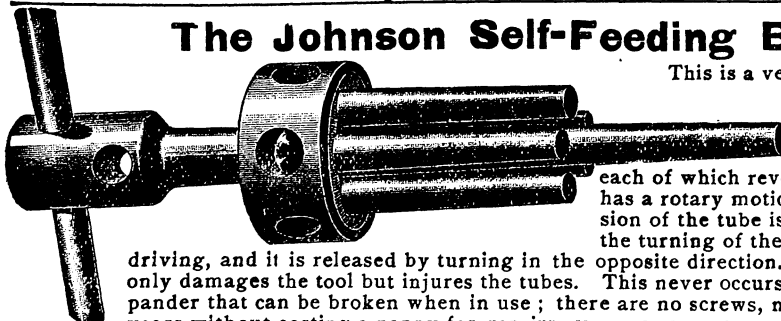


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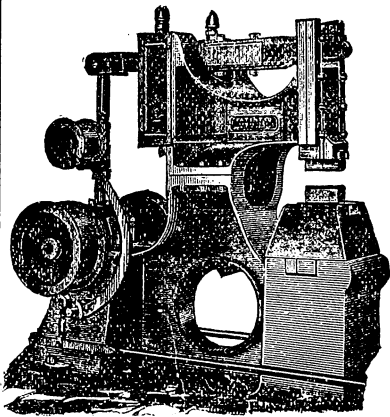
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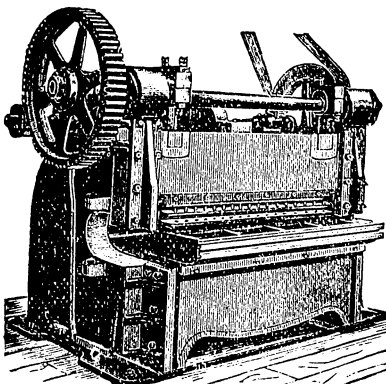
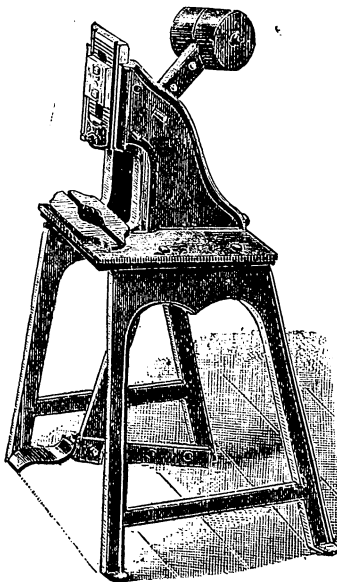
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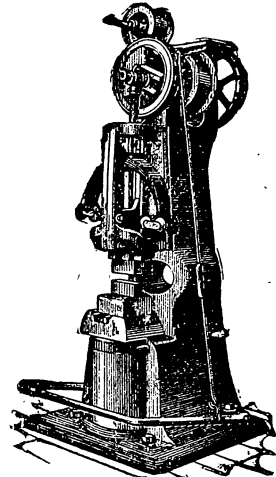
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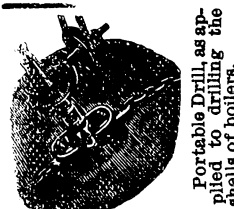
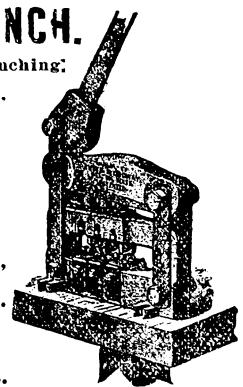
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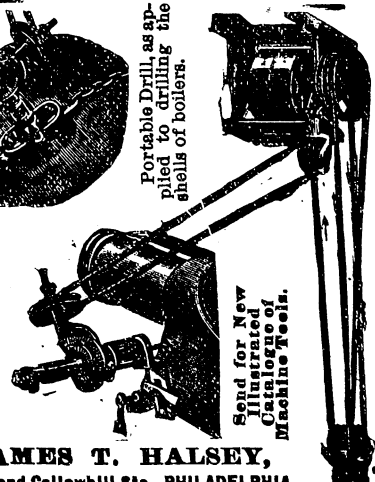
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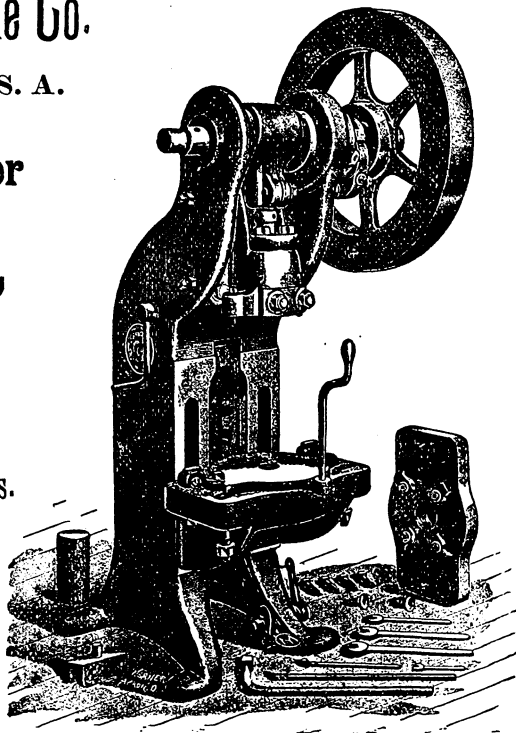
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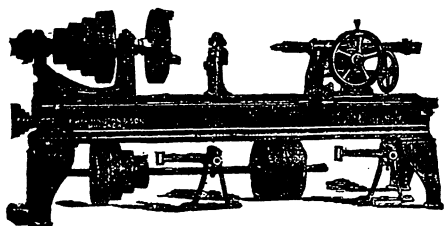
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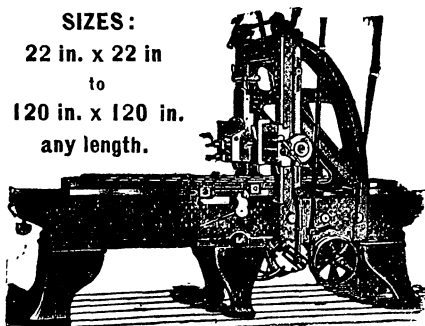
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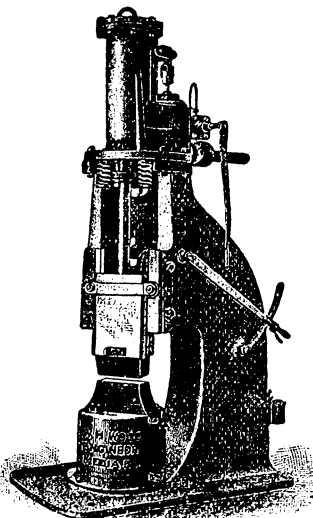
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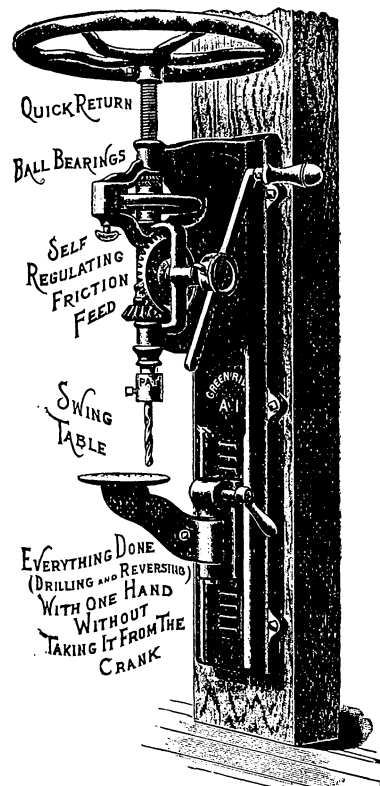
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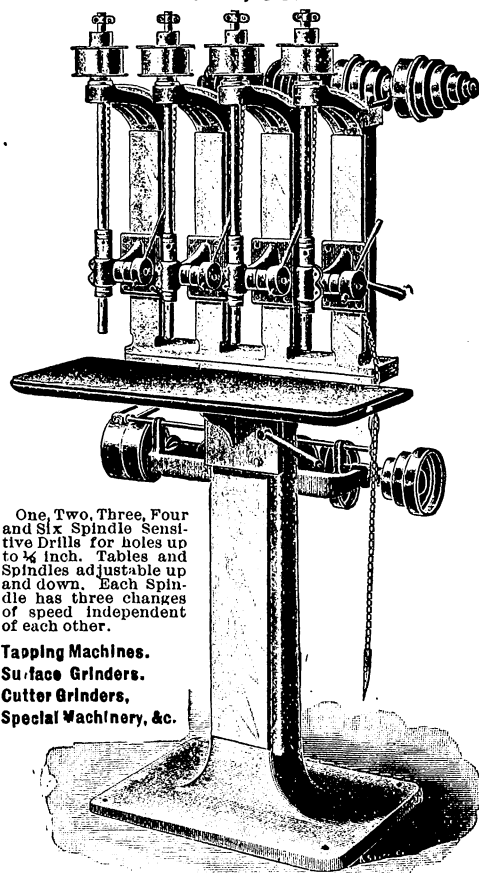
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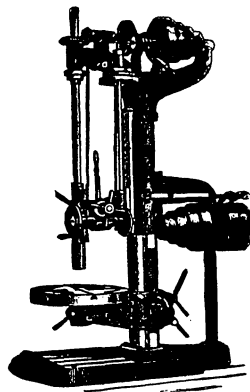
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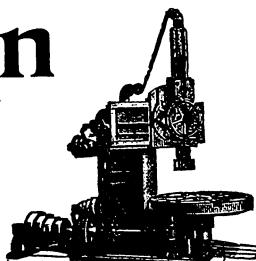
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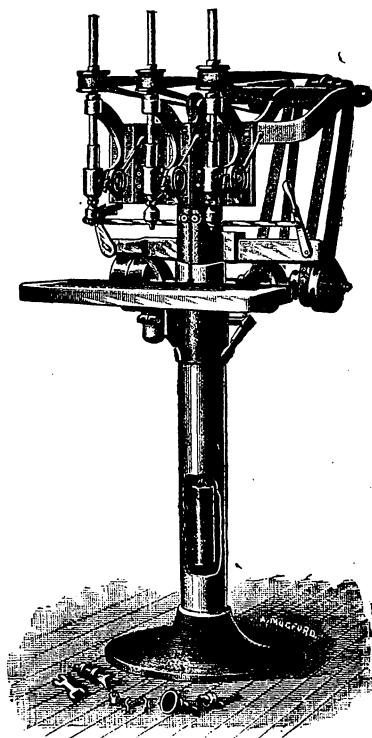
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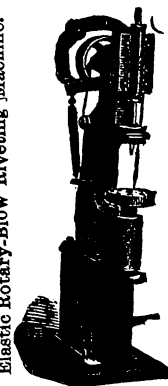
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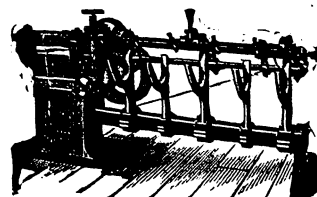
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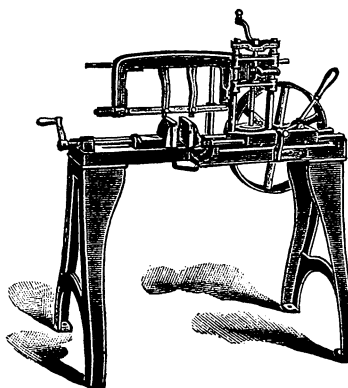


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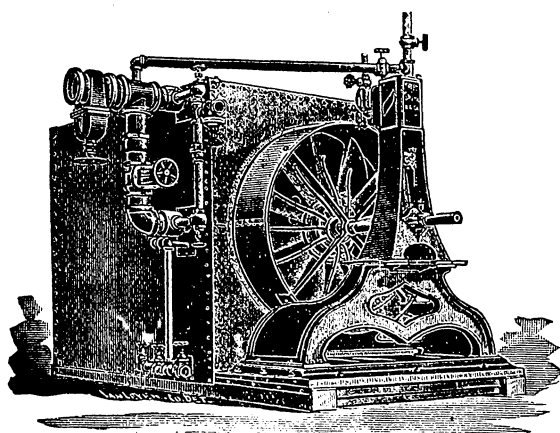
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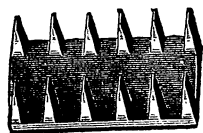
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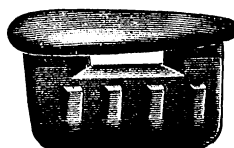
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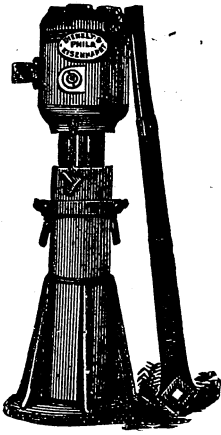
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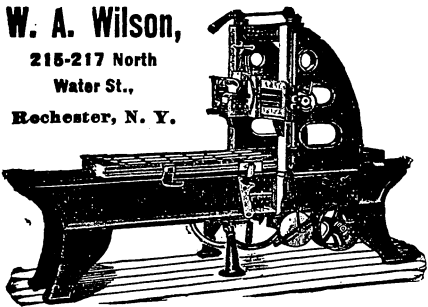
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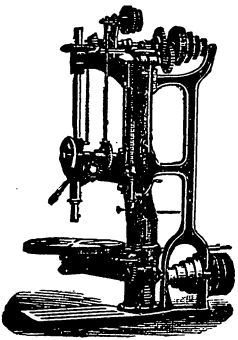
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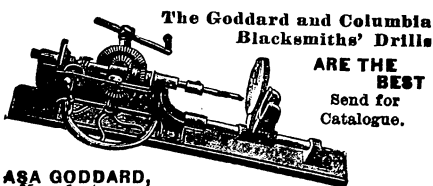
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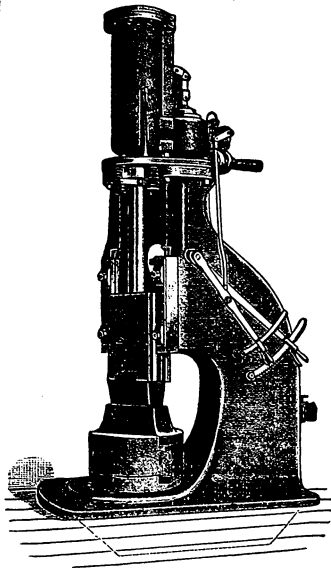
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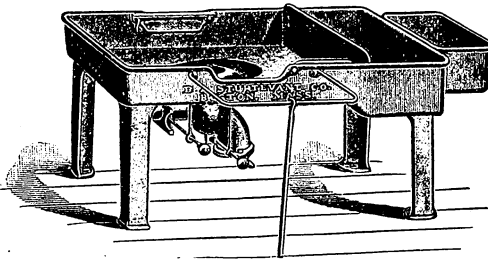
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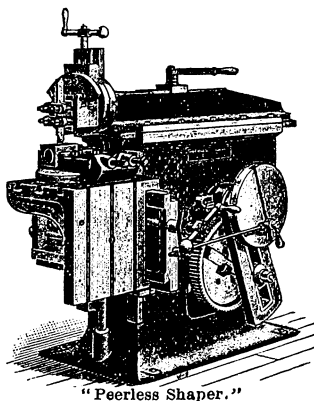
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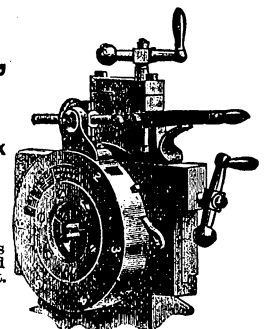
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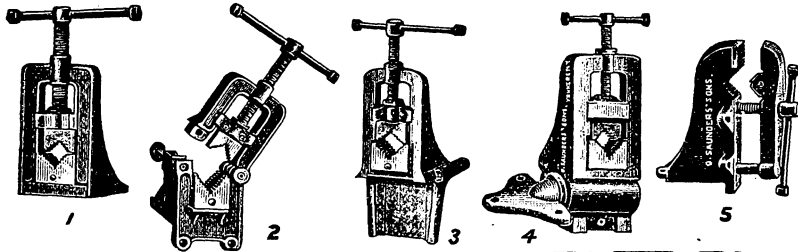
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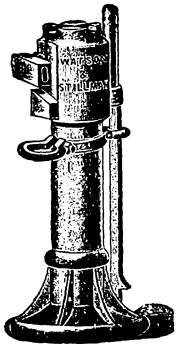
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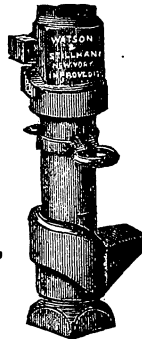
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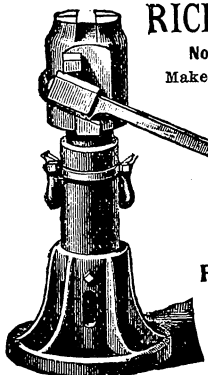
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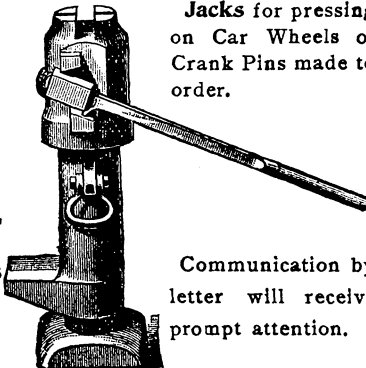
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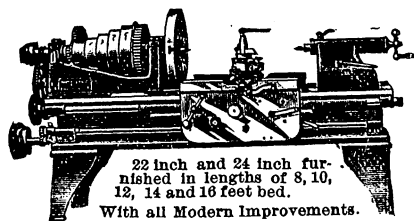
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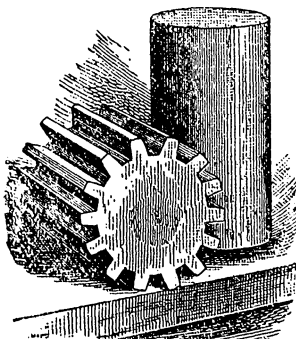
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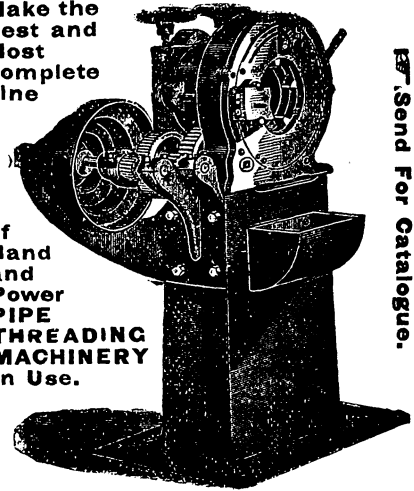


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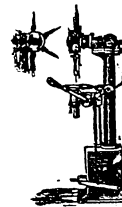


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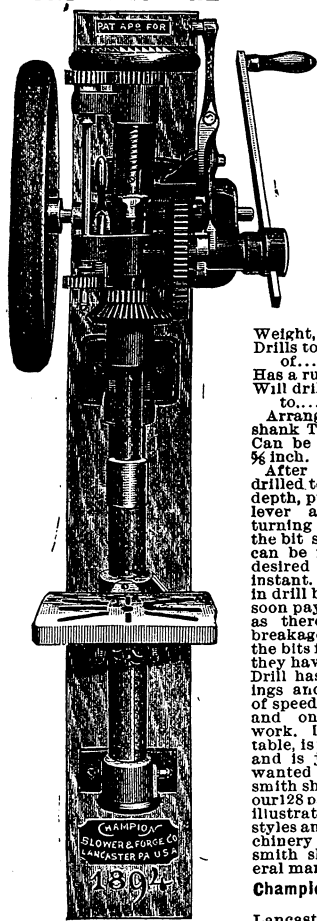
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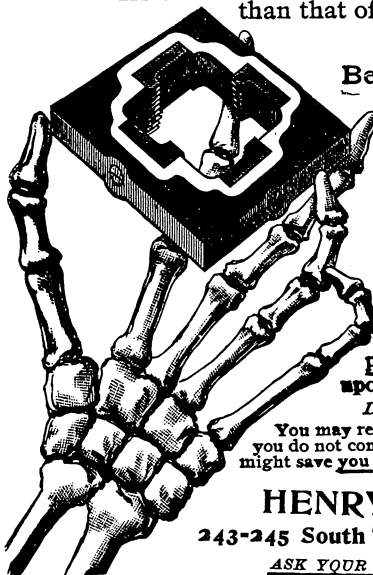
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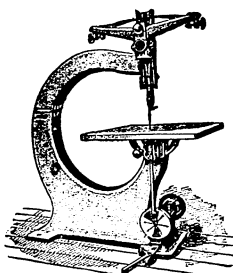
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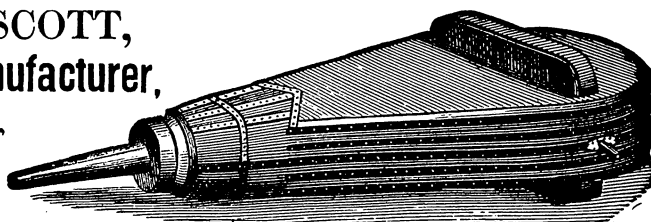
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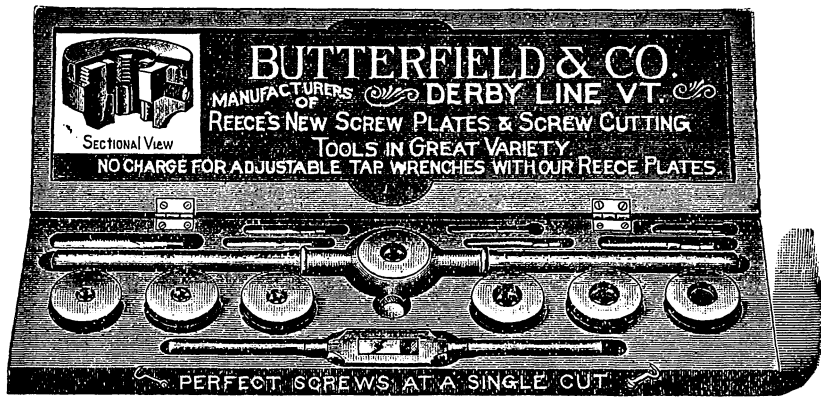
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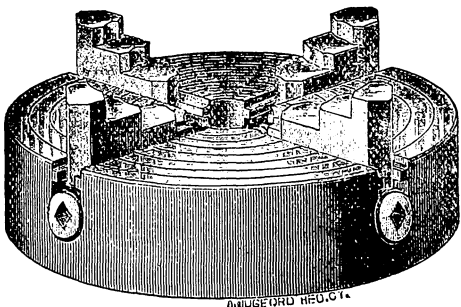
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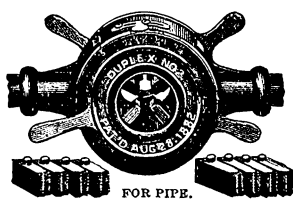
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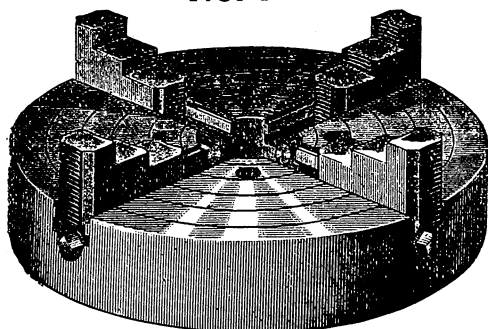
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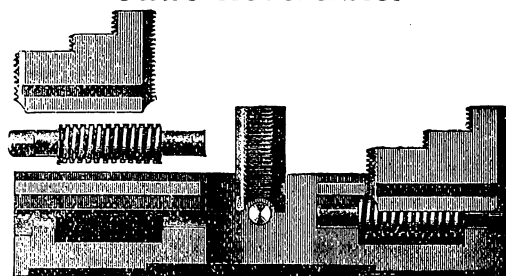
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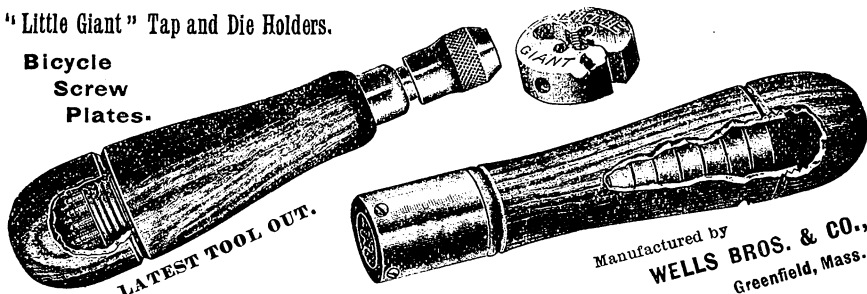


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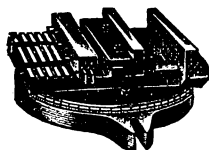
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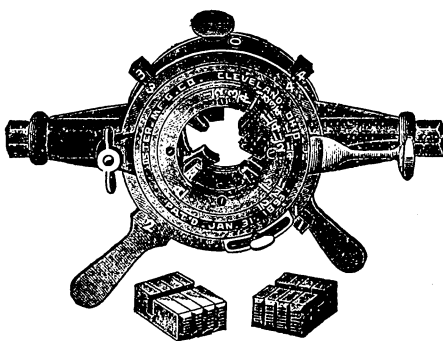
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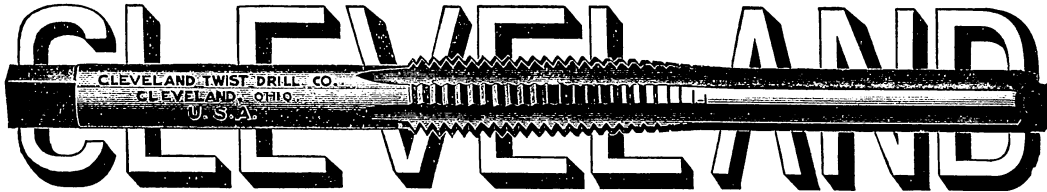
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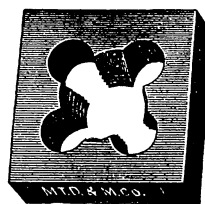
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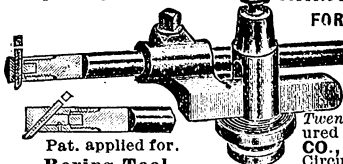
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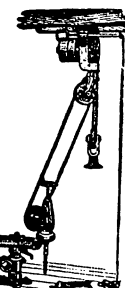
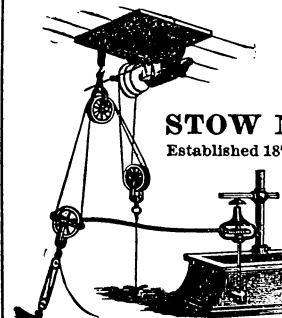
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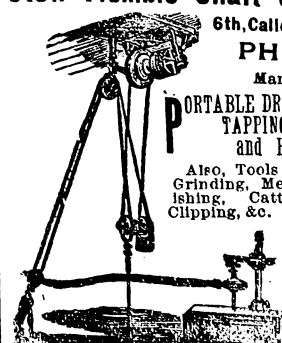
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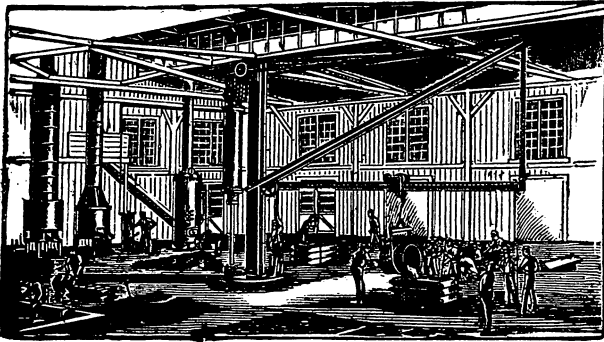
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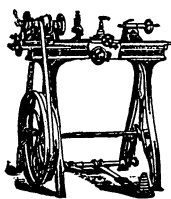


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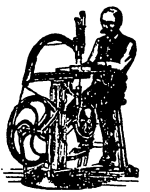
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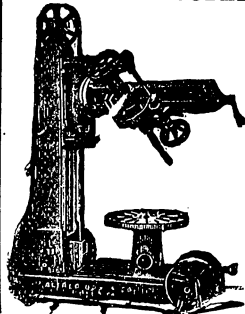
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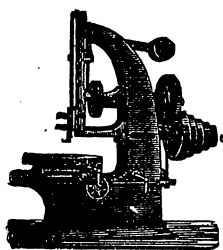
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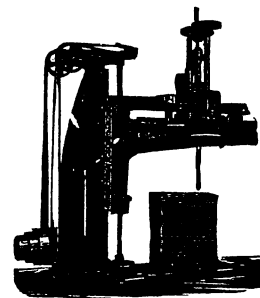


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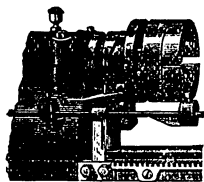
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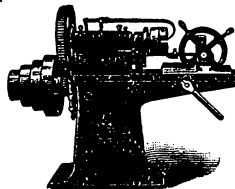
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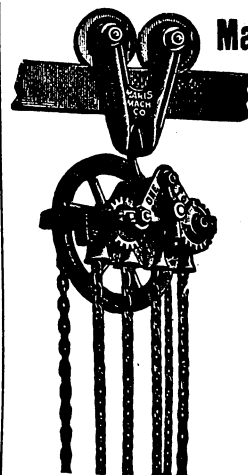
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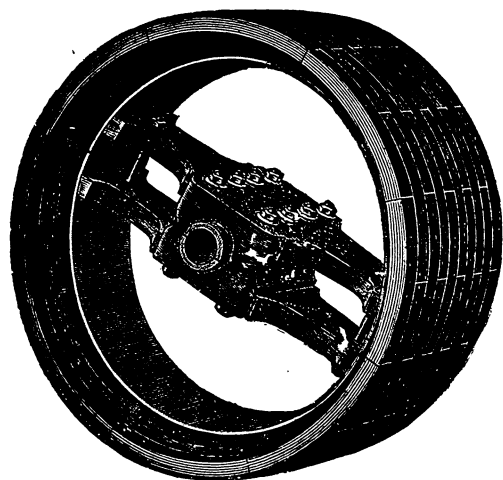
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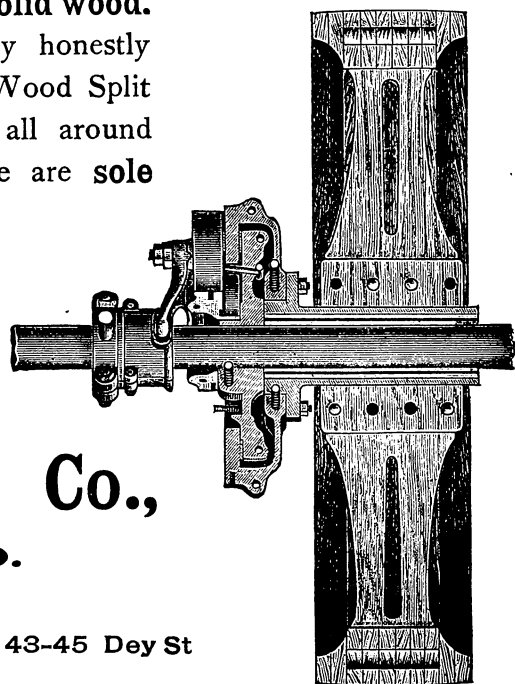
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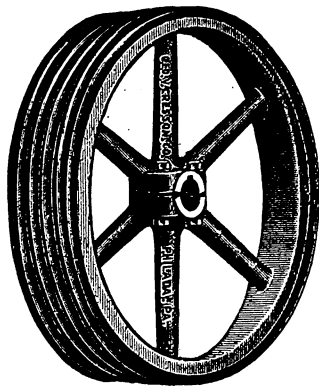
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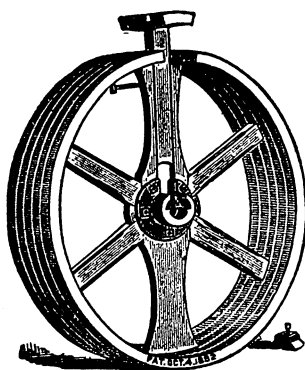
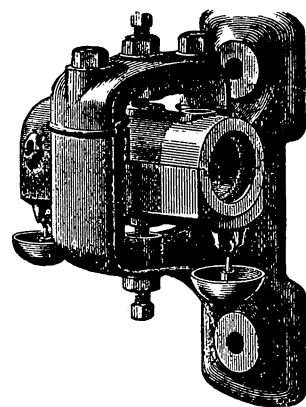
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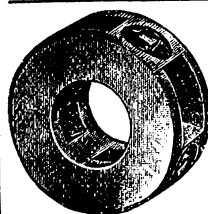
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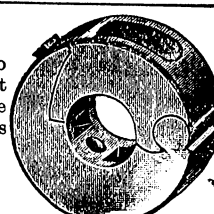
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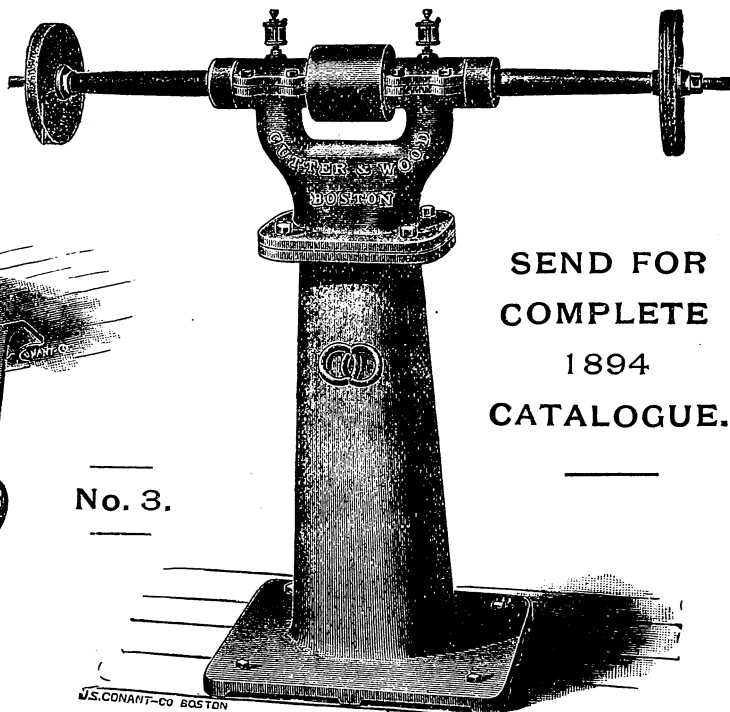


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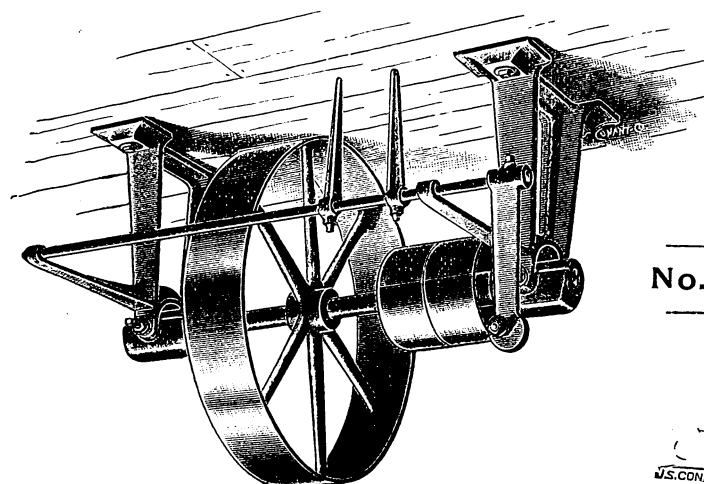
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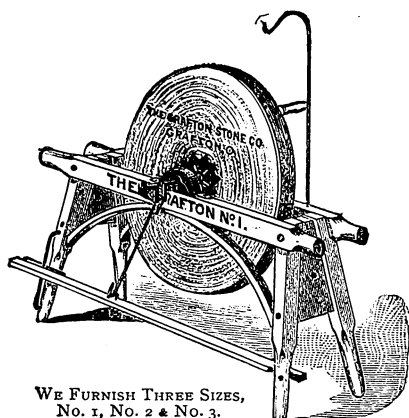
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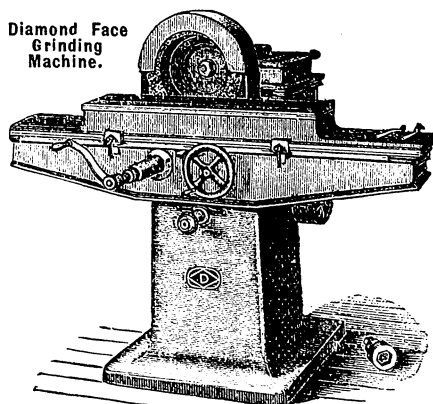
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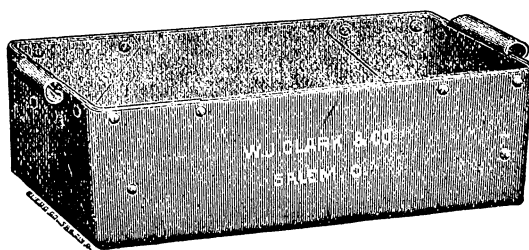
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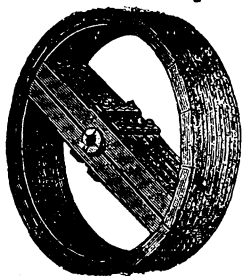
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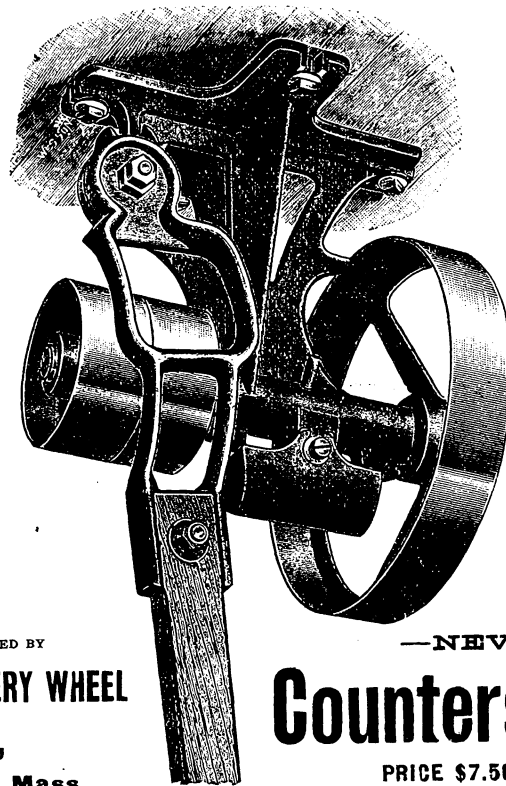
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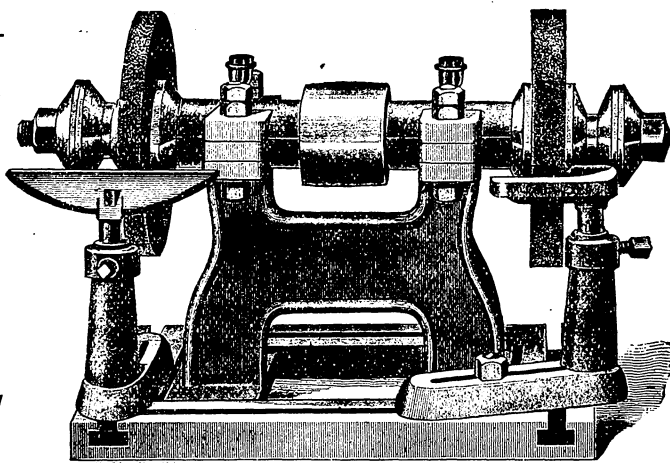
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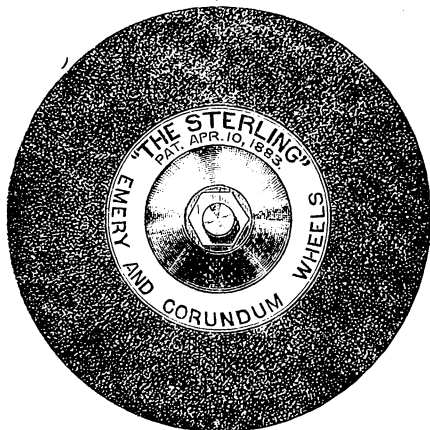


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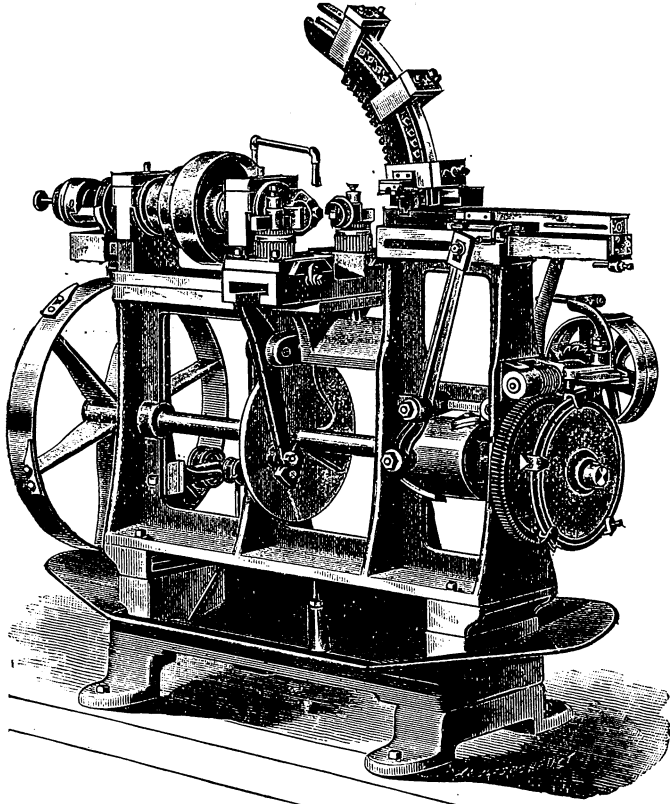
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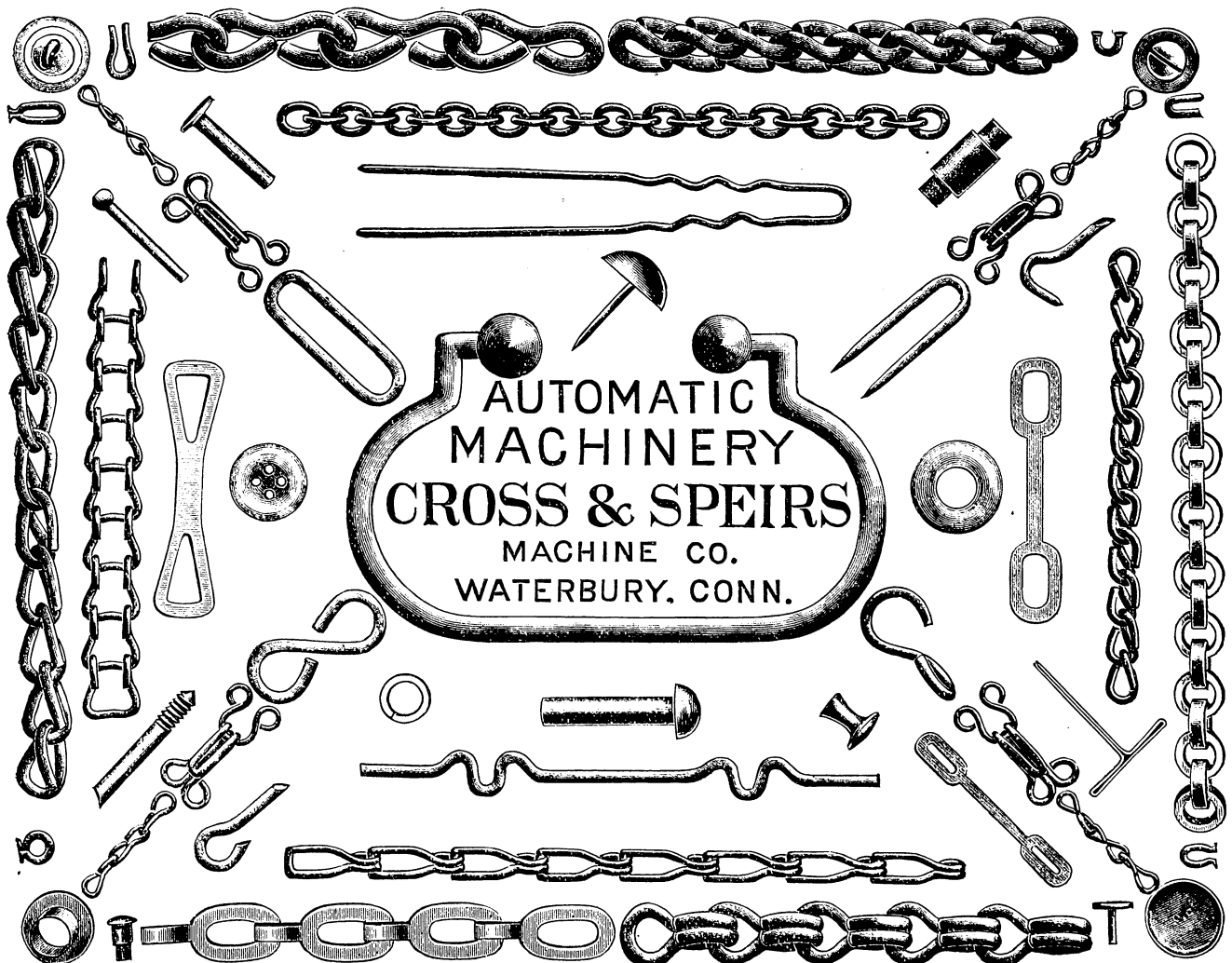
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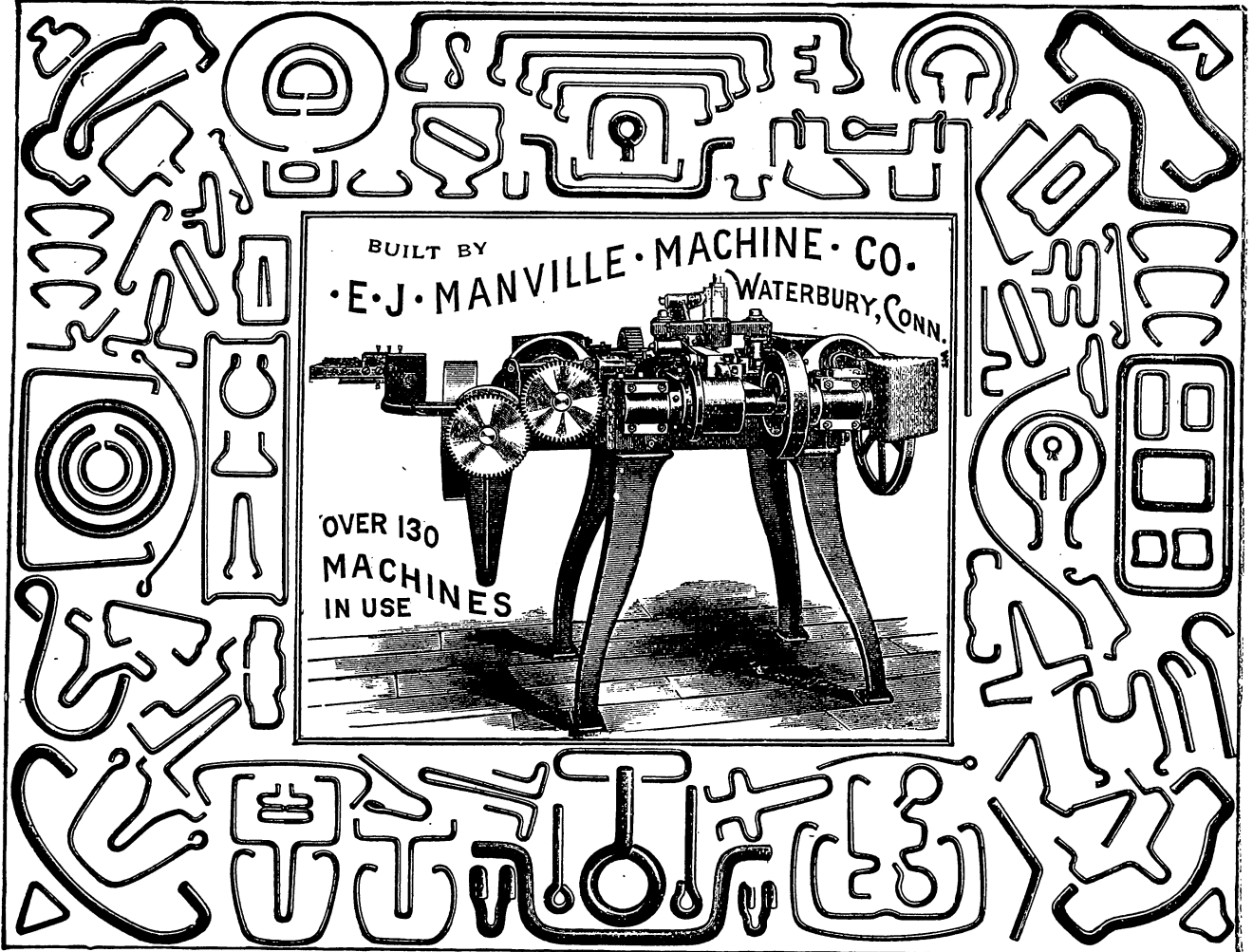
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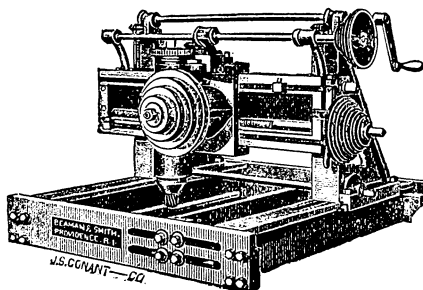
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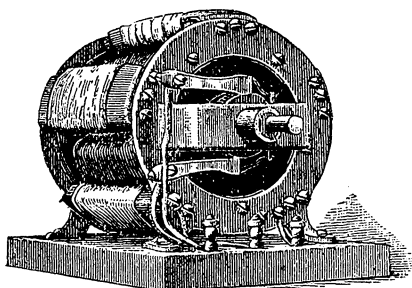
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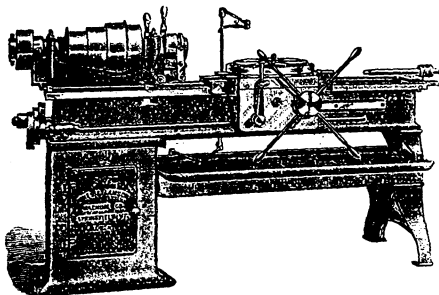
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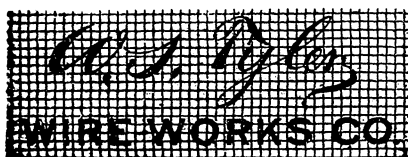
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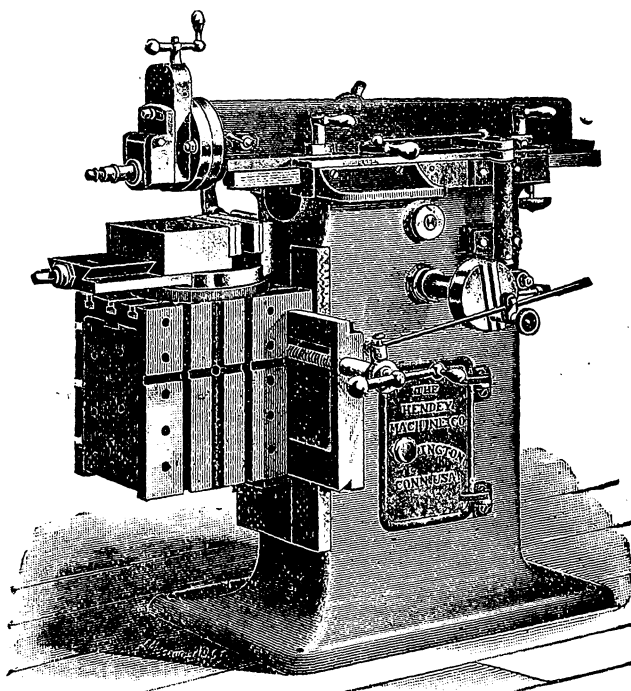
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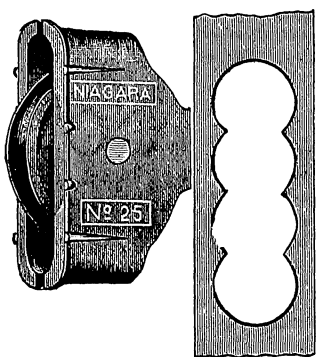
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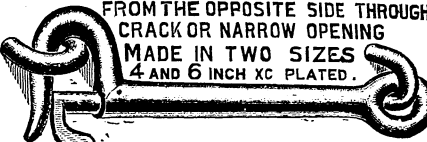
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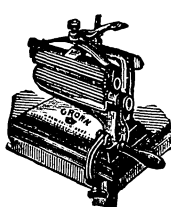
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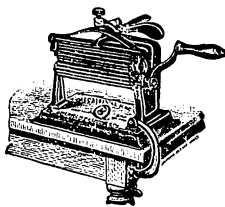
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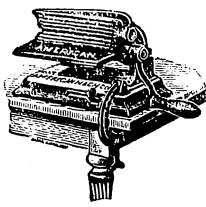
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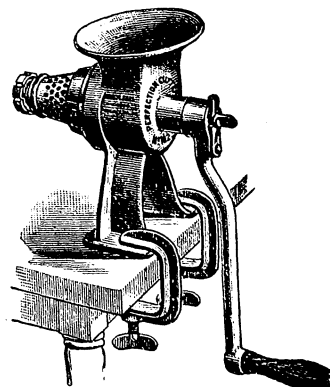
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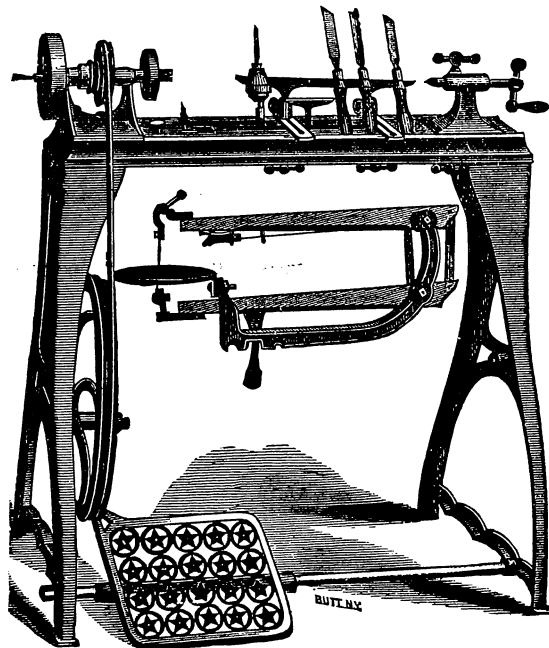
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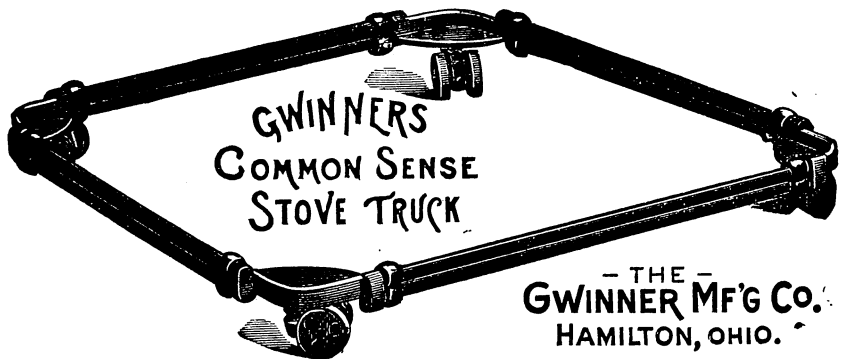
THE GEM SOLID STEEL MINCER



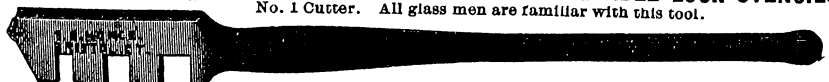
Single and Double Blades.

Handle and Blade Formed in one piece.
 Always Clean. Indestructible.
 No Rivets to Wear Loose.
 No Wooden Handle to Shrink, Swell, loosen, Split, or Fill with Rancid Grease.

MANUFACTURED BY
PALMER HARDWARE MFG. CO.
 TROY, N. Y.



MONCE'S NOVELTY GLASS CUTTERS. — **INTERCHANGEABLE LOCK STENCILS.**
 No. 1 Cutter. All glass men are familiar with this tool.



S. G. MONCE. — **BRISTOL, CONN.**
 Oh yes! It is imitated, but we never sold so many as at present. Make sure name is stamped on them.

CABINET LOCKS

OF EVERY KIND.

DRAWER LOCKS,

CUPBOARD LOCKS,

WARDROBE LOCKS,

CHEST LOCKS,

DESK LOCKS.

A complete line of more than 1000 list numbers exclusive of our old and complete line of

YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

The only question is Is it Le Page's?

If it is you have made a sale. **HUNDREDS** of **THOUSANDS** of **PLEASED** and **SATISFIED** **CUSTOMERS** testify to the merits of

~LE PAGE'S LIQUID GLUE.~

If you sell it you do not have to **WASTE ANY TIME** in answering questions as to its quality.

The people **KNOW** that **LE PAGE'S GLUE** is the **BEST**. They have used it for years and have proved our claims to be true.

It is the only Glue made WITHOUT ACIDS.

A dealer who regards his time as worth anything will not risk losing his **CUSTOMERS' CONFIDENCE** by trying to sell something which is **CLAIMED** to be "just as strong" and "just as good as LePage's."

Don't let your customers go to another store for what they want, but **SELL THEM WHAT THEY ASK FOR.**

We can furnish original and attractive advertising matter for "**LE PAGE'S GLUE**" upon request.

SEND FOR CIRCULARS AND PRICE-LIST.

RUSSIA CEMENT CO., Gloucester, Mass.

NEW YORK OFFICE, 95 Reade and 113 Chambers Streets.

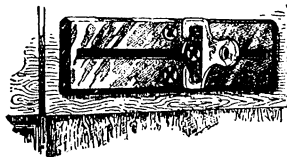
PACIFIC COAST OFFICE, 23 Davis St., San Francisco, Cal.

EVERY OWNER OF A HOUSE

ought to know about the "Salem" hanger. A **DOZEN TENANTS** can hang a **DOZEN DIFFERENT WIDTH** shades and not use a screw. **A HOUSE TEN YEARS OLD** with

the "Salem" on the casing will not have one damaging screw hole, where a house without it will show **HUNDREDS**. The hardware trade gladly supplied with samples and prices.

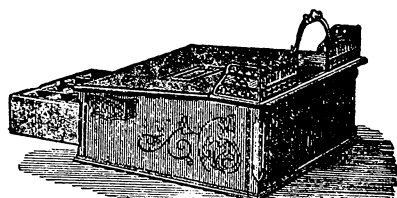
The W. A. South Co., Salem, Mass.



GEO. M. NESS, Jr.,
SUCCESSOR TO
Wm. Krogsrud,
Engraver and Die Sinker,
61 Fulton St., N. Y.
STEEL STAMPS
Steel Letters and Figures.
Burning Brands, Stencils,
&c. Send for Illustrated
Catalogue



CHAS. W. HOEFIG,
ENGRAVER AND DIE SINKER,
52 FULTON ST., - N. Y.
STEEL STAMPS,
BRASS DIES, BURNING BRANDS, &c.
Designs on Steel Finely Executed.



The Morford Automatic Cash Register.
THE MORFORD REGISTER CO.,
Mfrs. of Cash Registers and Cash Tills,
ALLENTOWN, PA. Send for Illustrated Catalogue.



HOW TO KEEP A STORE

BY S. H. TERRY.

406 PAGES, 5 x 7 1/4 INCHES;
POST-PAID, \$1.50.

Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods; examining, marking and arranging goods; how to advertise; employment of clerks; selling for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications.

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96-102 Reade St., New York.

W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

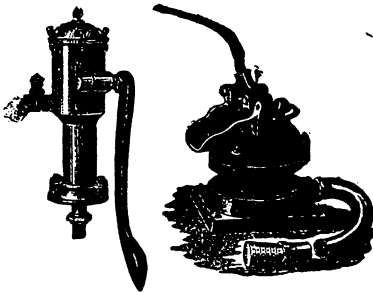
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 209.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by
hand power.

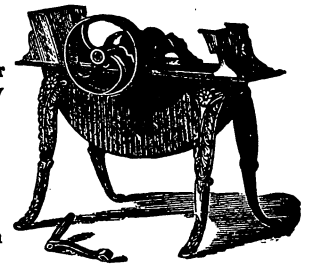
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.



O. I. Grindstone Frame.

THE DEMING CO.
FACTORY SALEM O.U.S.A.
MANUFACTURERS OF
HAND & POWER PUMPS, WELL SUPPLIES & C. VERTICAL STEAM PUMPING ENGINES.
N.Y. OFFICE: 72 JOHN ST.
NEWTON & HUBBELL
GEN'L WESTERN AGT: 55 & 57 N. CLINTON ST. CHICAGO, ILL.

PRENTISS' PAT. VISES.

The Leaders for 20 Years.

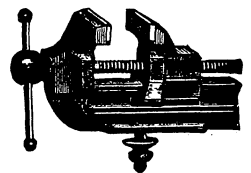
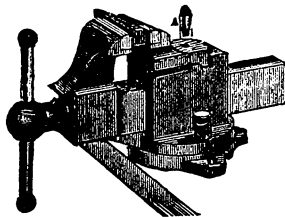
Send for Illustrated Catalogue
of

ALL KINDS OF VISES.

PRENTISS VISE COMPANY,

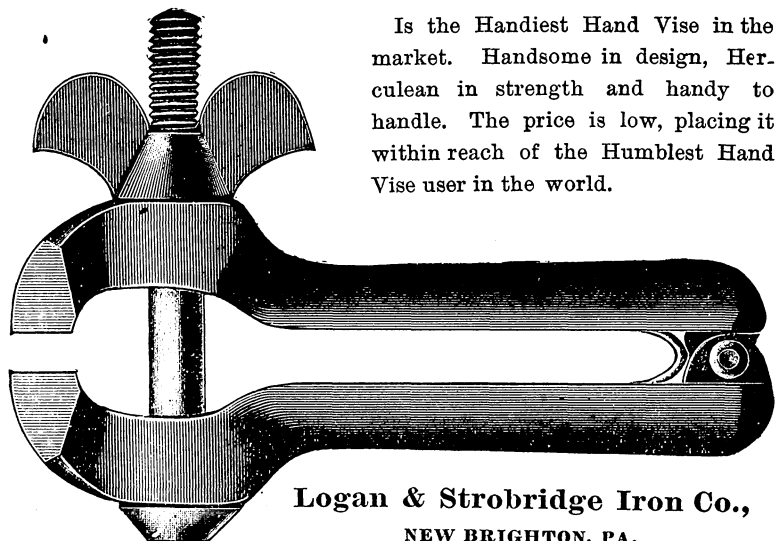
MANUFACTURERS,

44 Barclay St., New York.



BRIGHTON HAND VISE.

Is the Handiest Hand Vise in the market. Handsome in design, Herculean in strength and handy to handle. The price is low, placing it within reach of the Humblest Hand Vise user in the world.



Write
to
the
Mfrs.,

Logan & Strobbridge Iron Co.,
NEW BRIGHTON, PA.

MYERS & BRO.

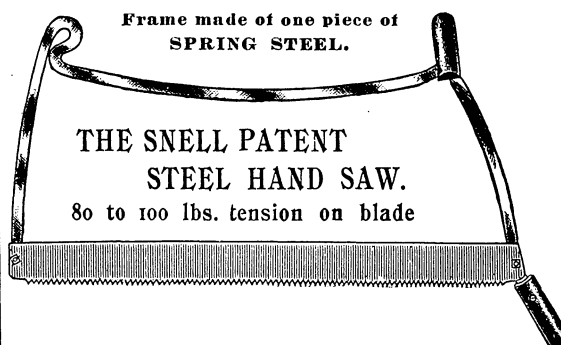
ASHLAND, O.
+ CATALOGUES FREE +
Ashland Pump and Hay Tool Works

The New York Safety Dumb Waiter.
"The Manhattan Dumb Waiter."
The Improved Humphrey Hand Elevator.
Made specially to be sold by Hardware Stores.
Thousands in use. Catalogues on application.
THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

Frame made of one piece of
SPRING STEEL.

THE SNELL PATENT
STEEL HAND SAW.

80 to 100 lbs. tension on blade



WILL NOT BEND NOR BREAK.

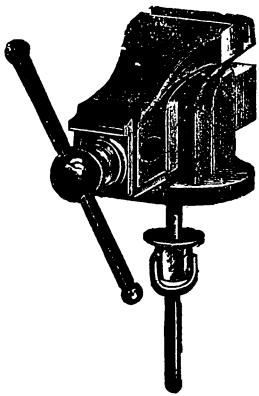
FACTORY, 330 to 338 First Street, So. Boston.

This saw is always
ready for use. Never
has to be adjusted after
blade is put in. Will
last a life-time.

Send for Descriptive Circular
and Prices to

Butler Mfg. Co.,

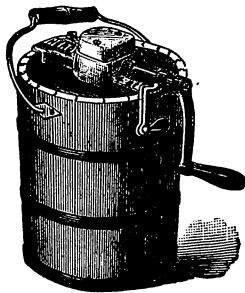
P. O. BOX 2180,
BOSTON, MASS.



HOLLAND'S OFFSET JAW VISE.

Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

Hollands Mfg. Co.,
ERIE, PA.,
Manufacturers all
styles VISES.



"HERO" ICE CREAM FREEZER.

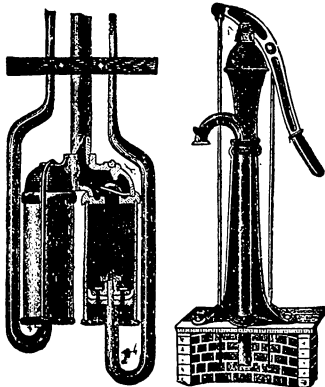
Double Action.
2 qt. to 10 qt.

ALSO
"Home" Freezer
2 to 10 qt.,
AND

"Rapid" Freezer
2 to 40 qt.

Clement & Dunbar,
1129 Beach St., Philadelphia.

Peters Double Cylinder Force Pump. EASIEST WORKING PUMP IN THE MARKET.



Will send any responsible dealer a sample to be returned in 30 days if not perfectly satisfactory.

WRITE FOR CIRCULARS AND PRICES.
PETERS PUMP CO., - KEWANEE, ILL.

TAINTOR POSITIVE SAW SET.



Wiebusch &
Hilger, Agts.,
84 & 86 Chambers
St.,
N. Y.

No. 93.

CARPENTERS' & MACHINISTS'

IRON BENCH LEVEL

WITH DOUBLE PLUMB.

No. 5. 6 in.



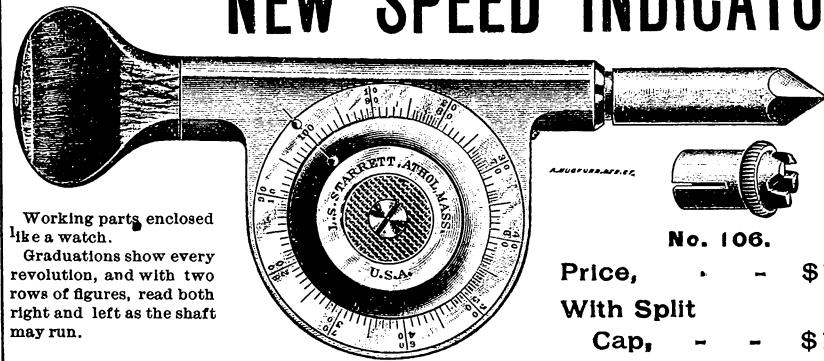
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C. F. RICHARDSON & SON,

ATHOL, MASS.

Starrett's

NEW SPEED INDICATOR.



Working parts enclosed like a watch.

Graduations show every revolution, and with two rows of figures, read both right and left as the shaft may run.

No. 106.

Price, - - \$1.50

With Split
Cap, - - \$1.75

THE BEST INDICATOR

On the market at anywhere near the price.

Send for 80-page Catalogue of Fine Mechanical Tools.

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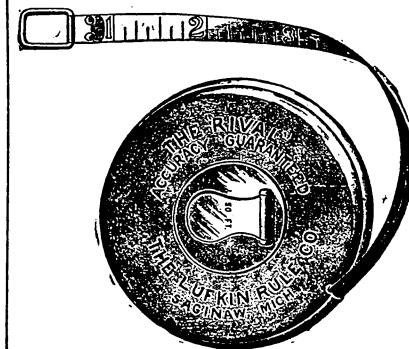
LONDON:

Chas. Churchill & Co., Ltd., 21 Cross St., Finsbury, E.C.

BERLIN:

Schuchardt & Schütte, 59 Spandauerstrasse.

Athol, Mass., U. S. A.



"RIVAL"

Steel Measuring Tapes.

Something New! A low priced Steel Tape. First-class and fully guaranteed. Nickel Plated Case. Flush Handle. $\frac{3}{8}$ in. Tape. Marked one side only. Made 25, 50, 75, 100 feet lengths.

LUFKIN RULE CO., Saginaw, Mich.

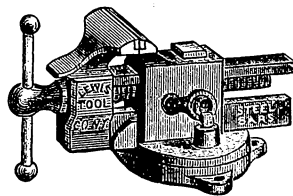
NEW YORK OFFICE, 2 $\frac{1}{2}$ MURRAY ST.

LEWIS' PATENT

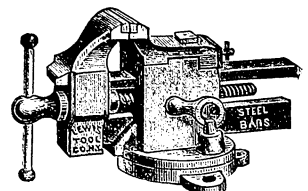
DOUBLE STEEL SLIDE BAR VISES.

—FOR—

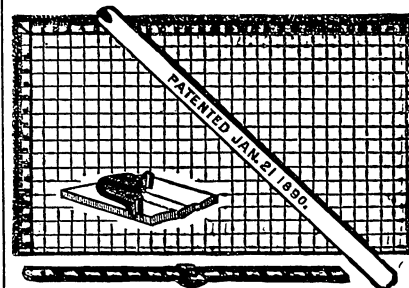
All Kinds of Vise
Work.



Send for Illustrated
Catalogue.



Lewis Tool Co., 44 Barclay St., New York.



The Canton Glass Board.

Cuts any Fraction of an Inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

—ALSO—

IMPROVED TRAMMEL RULE for Cutting Circles

From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

Send for Circular.

The Canton Saw Co., Canton, Ohio

THE ART OF SELLING.

By F. B. GODDARD.

12mo, Flexible Cloth, 50 Cents.

In this book the author lets the reader into the secrets of the accomplished and successful salesman, illustrates his tact and finesse, and tells how he masters men: but beyond this, the work embraces much information which will be instructive and useful to all classes of business men. Besides suggestions to buyers, it contains chapters on "Changes in Business Conditions and Methods," "Salesmen's Compensation," "Retail Merchants and Salesmen," "Saleswomen," "How to Read Character," with a collection of clearly and tersely put important Legal Principles and Decisions Governing Sales. Sent, post-paid, upon receipt of price, by

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THE NATIONAL SAW CO.,

OPERATING

Wheeler, Madden & Clemson Mfg Co., Wood-
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vey W. Peace Co., Monbagen Steel Works, Wood-
rough & Clemson, Pennsylvania Saw Co.

SEND FOR PRICE-LIST.

GENERAL OFFICE :

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SAWS

WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.
Will make no more noise than Filing on a Solid Piece of
Iron.

Have a Larger Sale than All Other Kinds Combined.

PRICE LIST.

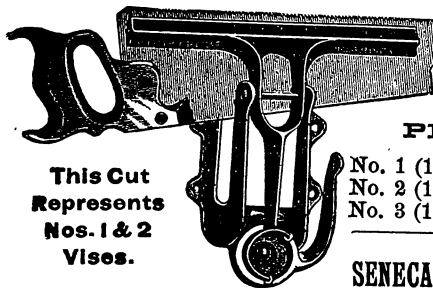
No. 1 (11 inch Jaws),	-	PER DOZ.
No. 2 (15 inch Jaws),	-	\$15.00
No. 3 (11 inch Jaws),	-	21.00
	-	18.00

LIBERAL DISCOUNT TO THE TRADE.

LONGEST JAWS, HEAVIEST AND
BEST FINISHED.
Sold by all leading jobbers of gen-
eral Hardware at Factory Prices.

-MANUFACTURED BY-

SENECA FALLS MFG. CO., 255 Water St., Seneca Falls, N. Y.



E. C. ATKINS & CO., Indianapolis, Ind.

BRANCH HOUSES:
Memphis, Tenn.
Chattanooga, Tenn.
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CIRCULAR, BAND, CROSS-CUT AND HAND SAWS. ATKINS' COLUMBIAN CROSS-CUT SAW.

MANUFACTURED UNDER OUR PATENTS.

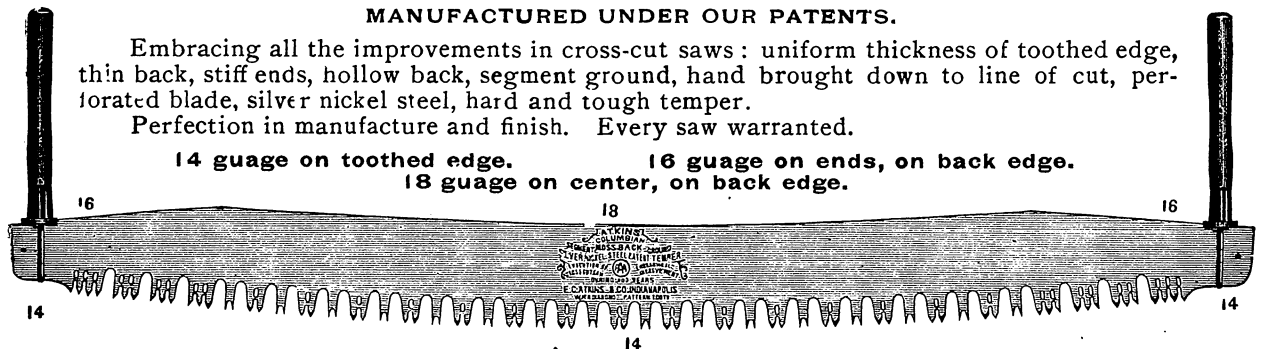
Embracing all the improvements in cross-cut saws: uniform thickness of toothed edge, thin back, stiff ends, hollow back, segment ground, hand brought down to line of cut, perforated blade, silver nickel steel, hard and tough temper.

Perfection in manufacture and finish. Every saw warranted.

14 guage on toothed edge.

16 guage on ends, on back edge.

18 guage on center, on back edge.



The toothed edge of the Columbian Saw will remain same thickness until teeth are worn out—on other saws teeth become thinner as they wear out.

ALLENTOWN HARDWARE WORKS.

Manufacturers of the latest and most im-
proved Locks, Butts, Knobs, General Builders'
Hardware, &c. Electro, Brass, Silver, Bronze and
Nickel Plating, House Door Trimmings, Sash
Locks, Sash Pulleys, Casters, Bronze and Brass
Work of all descriptions. High Grade Light
Gray Iron Castings, Soft, Smooth and Easily
Drilled. Patented Articles a specialty. Superior
Quality. Estimates furnished on application
from drawings and specifications. Bronze,
Brass and Composition Castings. Japanning,
Metal Art Work. Common Iron Castings made
to order at short notice. First Premium and
Dipolma awarded for the best and most artistic
display of General Hardware. Fine Iron
Brass Castings and Metals by the Pennsylvania
State (Bethlehem) and Allentown Fairs. Archi-
tects and Builders are invited to examine our
patent new style door lock, the best, most
stylish and complete manufactured. Also
manufacturers of Refrigerator Locks and
Trimmings of new, beautiful design, finish
and of the latest pattern, made expressly for
the coming season, without exception the best
ever used on a refrigerator. Write for cat-
alogue and full information to

P O. Address, ALLENTOWN, PA.

THE

SIMONDS MFG. CO. GOLD MEDALS AND HIGHEST AWARDS. A NEW 1885 4 GM OLEDS BOSTON 1887 4 GM OLEDS SAN FRANCISCO 1889 4 GM OLEDS CHICAGO 1893 4 GM OLEDS AND INNUMERABLE AWARDS. WE MAKE SOLID TOOTH AND INSERT POINT

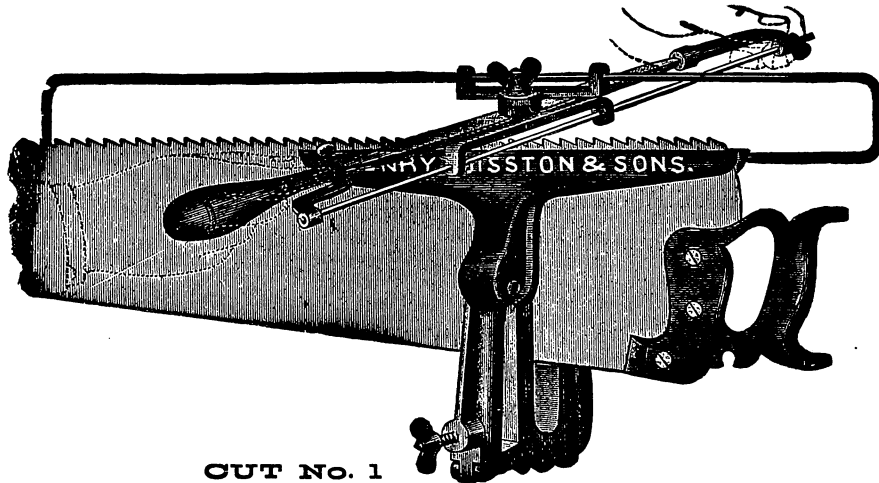
CIRCULAR SAWS. STRAIGHT SAWS SUCH AS GANG, MILL, MULAY AND DRAG SAWS AND THE CRESCENT GROUND CUT. BAND SAWS FROM ONE EIGHTH INCHES TO TWELVE INCHES IN WIDTH. ALL KINDS. OF SCROLL SAWS WE ARE THE LARGEST MANUFACTURERS OF MACHINE KNIVES IN THE WORLD.

AND

WE MAKE EVERYTHING IN THE SHAPE OF KNIVES. OUR ADDRESSES ARE SIMONDS MFG. CO. 21 SOUTH 4TH ST. ST. LOUIS, MO. SIMONDS MFG. CO. PORTLAND, OREGON. SELLING AGENCIES: L.A. KIMBALL 107 LIBERTY ST. NEW YORK CITY. SIMONDS MFG. CO. LTD. 23 MAGAZINE ST. NEW ORLEANS, LA.

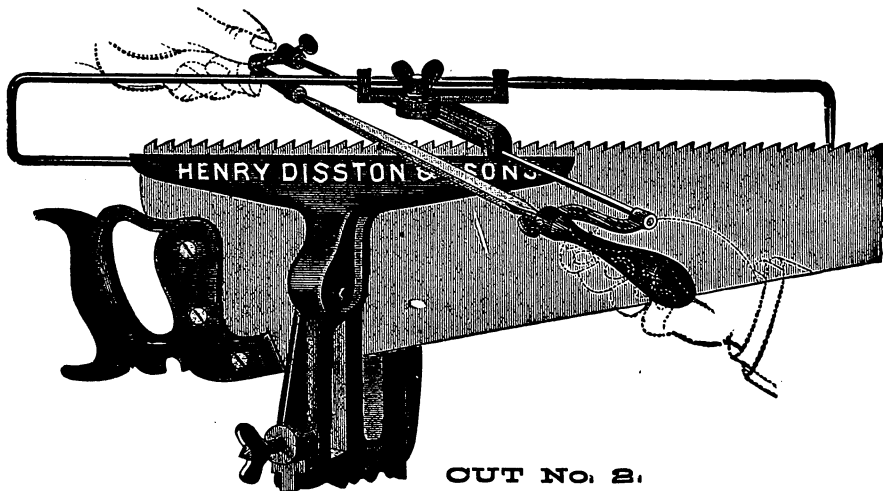
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT NO. 1

Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete; Packed one in a wooden box.

Henry Disston & Sons, Philadelphia, Penn. INCORPORATED.

SAMUEL W. ALLERTON, Prest. COURTLANDT C. CLARKE, Sec'y and Treas. ALFRED WEED, Vice-Prest. and Gen. Mgr.

ESTABLISHED 1842.

THE ARCADE FILE WORKS, ANDERSON, IND.

ALLERTON, CLARKE and WEED, Props.

QUALITY WILL WIN!

We now have the most modern and best equipped File Works in the world. The fact that we alone use the improved File Machinery recently invented by our Mr. Alfred Weed, enables us to produce Files that cut faster and wear longer than any on the market.

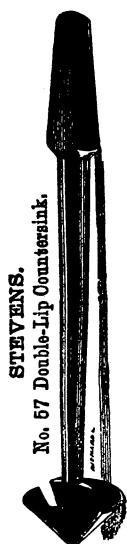
Eastern Office,
NEW YORK.

Works,
ANDERSON, IND.,

Western Office,
CHICAGO.

Patent Double Lip Countersink.

The Fastest and Best
Cutting Tool Made.



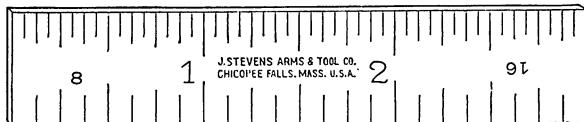
It can be sharpened to a keen edge, so that it will cut perfectly smooth in any kind of wood, and not leave the wood on the surface torn or rough. It will clear itself of its shavings, leaving the edge free to cut. This is the only double lip, self-centering Countersink for wood which is a sharp edge tool, and is made by the only true principle for a perfect working Countersink. They are made from the best of steel, forged and twisted, *strong and durable*; can be easily sharpened from the inside. These Countersinks are now in use in many of the largest Railway Car, Coach and Carriage Manufactories, by Carpenters, Pattern Makers, etc.

Finest Mechanical
Tools.

Send for
Catalogue of
Complete Line.

Steel Rules.

The Flexible Rules of very thin watch spring tempered steel, represented in above cut, are graduated in 32ds and 64ths on one side only, from 1 inch to 12 inches in length. These rules are invaluable to all fine workmen for measuring irregular surfaces.



J. STEVENS ARMS & TOOL CO.,

CHICOPEE FALLS, MASS.

P. O. Box 5729.

Warranted Better than the Best
ENGLISH ANVIL

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough *untampered steel*, never to break or bend. *Only Anvil made in the United States fully warranted as above.*

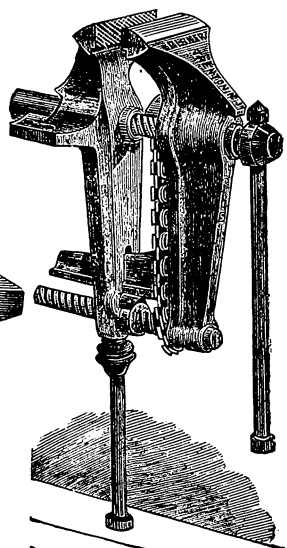
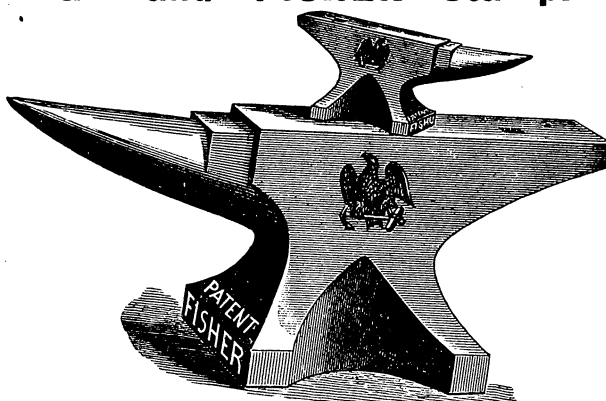
FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.



EAGLE ANVIL WORKS,

Trenton, N. J.

Sold in New York by our Agents, J. O. McCarty & Co., 97 Chambers St., The Russell & Erwin Mfg. Co.
45 Chambers St.

— REMEMBER —

WE MAKE ONLY

The Very Highest Grade
OF

MECHANICS' TOOLS.

N. H. MAYHEW CO., Shelburne Falls, Mass.

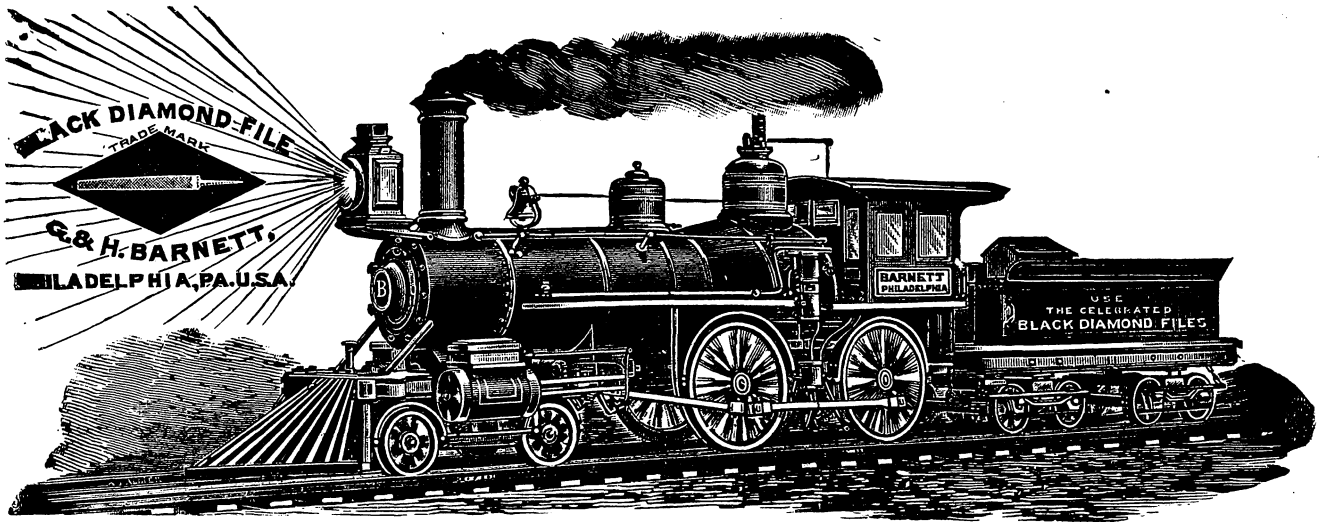
HAVE YOU EVER HEARD OF



THE WONDERFUL FORSTNER AUGER BIT ?

If not, it will pay you to send for a sample 4-8 bit and price-list. Sent on receipt of 55 cents. It will bore Round, Oval and Square Holes, and cannot be equalled for fine carpentry, cabinet or pattern work. Discount to dealers on application.

FOR SALE BY ALL HARDWARE DEALERS.
THE BRIDGEPORT GUN IMPLEMENT CO.,
313 and 315 Broadway, New York.



THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.

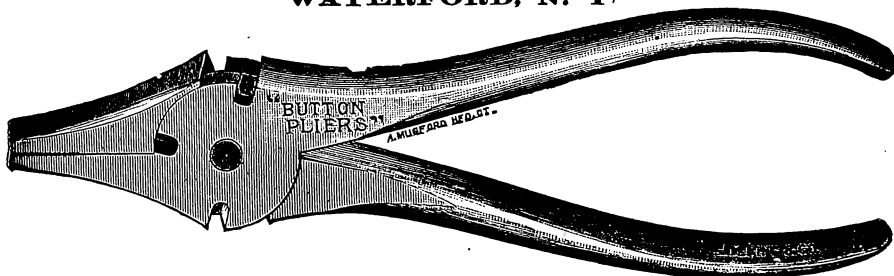
NICHOLSON FILE CO.

PROVIDENCE, R. I.

3000 VARIETIES FILES [X.F.] AND INCREMENT CUT FILES

J. M. KING & CO., WATERFORD, N. Y.

Manufacturers of **BUTTON'S**



Pat. Wire Cutter AND PLIER COMBINED.

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and MACHINISTS' STOCKS and DIES, PLUG and TAPER TAPS, HAND, NUT and SCREW TAPS, PIPE TAPS and REAMERS.

Price-List on Application.

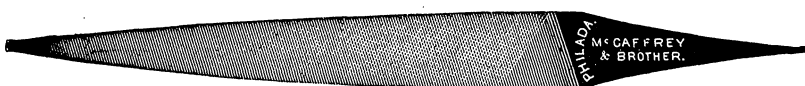
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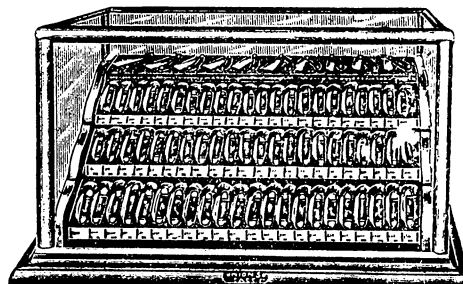


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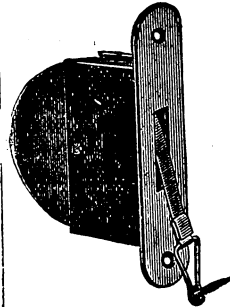
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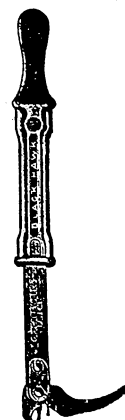
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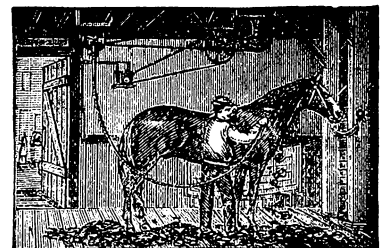
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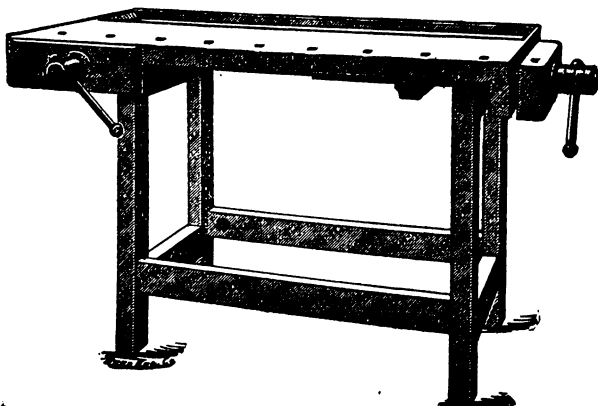
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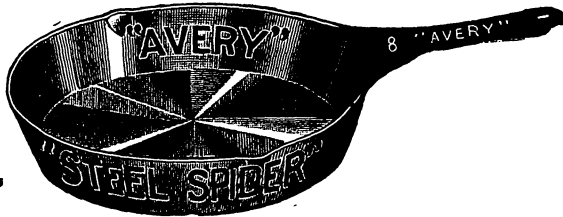
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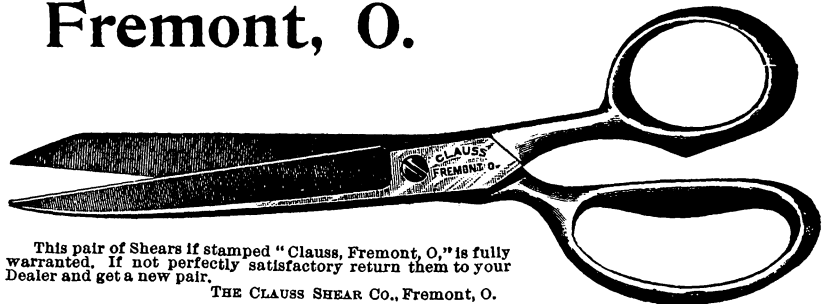


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This pair of Shears if stamped "Clauss, Fremont, O." is fully warranted. If not perfectly satisfactory return them to your Dealer and get a new pair.

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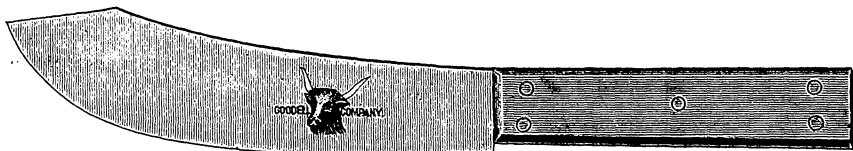
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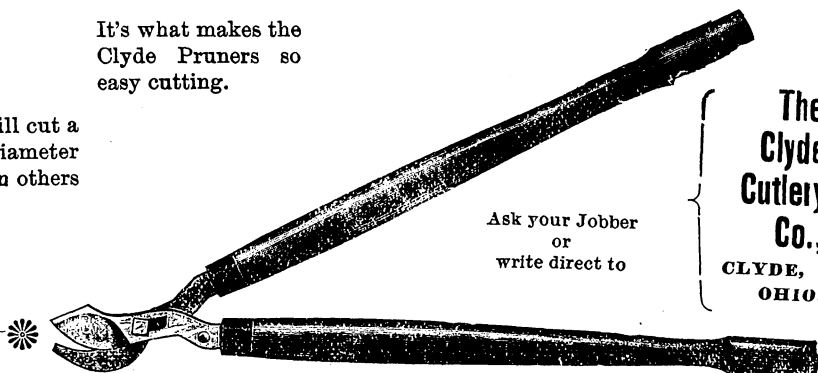
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Think of it! It will cut a
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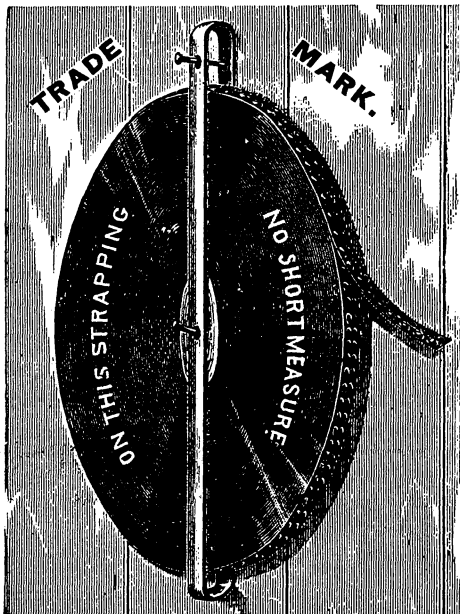
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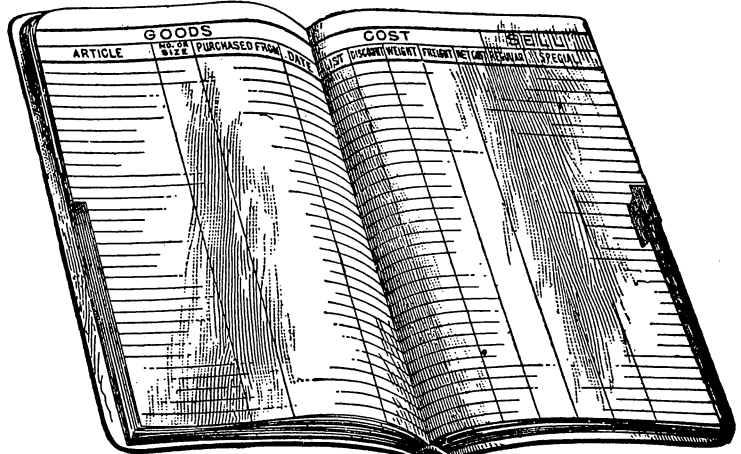
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

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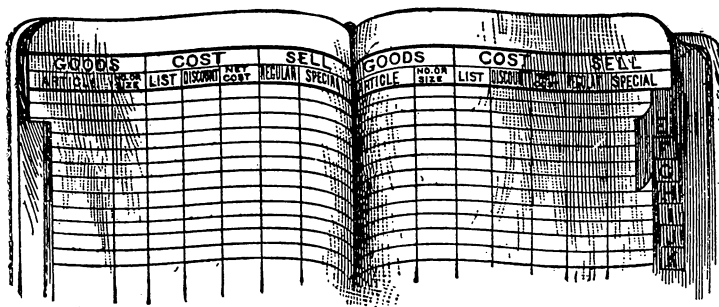
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

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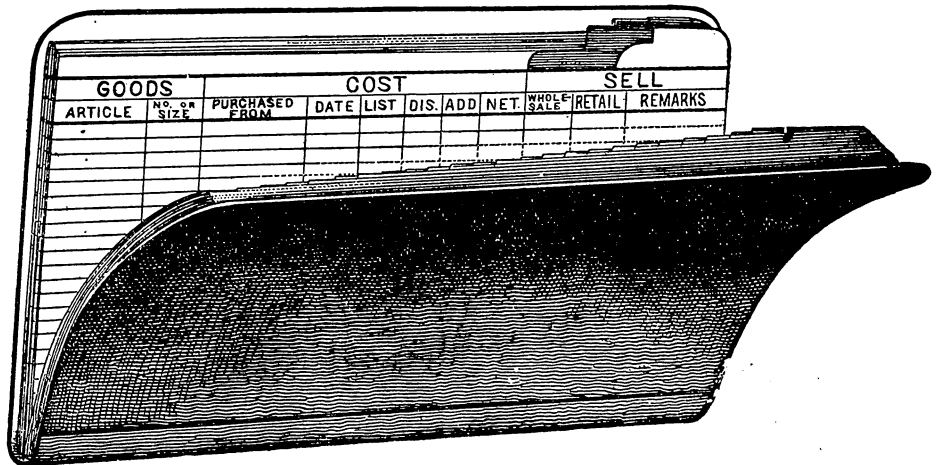
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

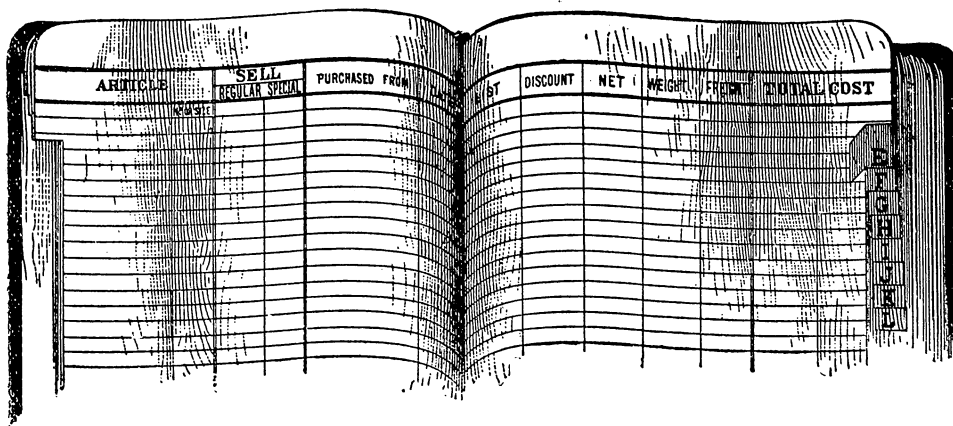
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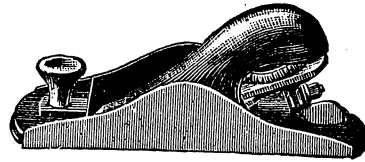
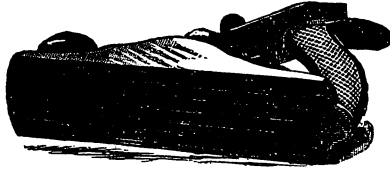
Sent, post-paid, on receipt of price by DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.

Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This ar-

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Chaplin's Pat.
Iron Planes,
Corrugated
Bottoms,
Checkered
Rubber Handles.



Chaplin's Block
Planes, Solid
and Adjustable
Throats.
Nickel and
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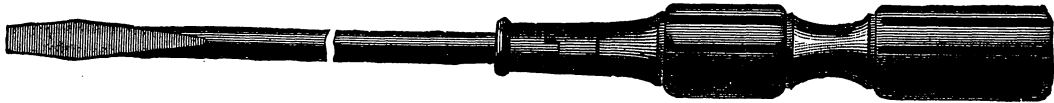
The Fluted
Handle Gives
the Best
Possible Grip.



CHAMPION CABINET SCREW DRIVER.



CHAMPION SCREW DRIVER.

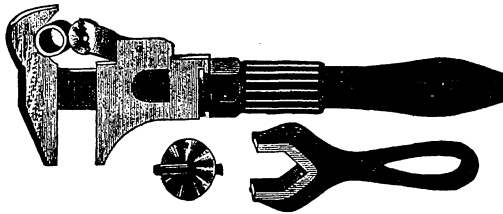


CHAMPION MACHINISTS' SCREW DRIVERS.

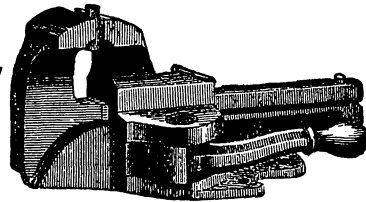
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ENGINEERS'
WRENCHES,
SHORT AND
LONG NUTS
AND WITH
PIPE
CUTTERS.



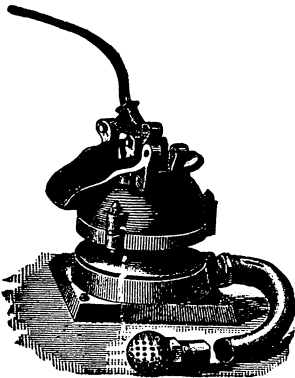
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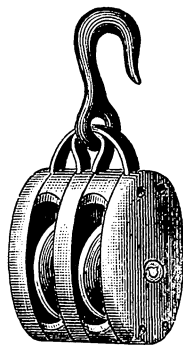
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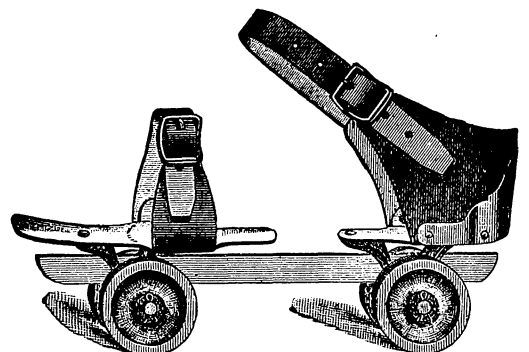
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Union Brand

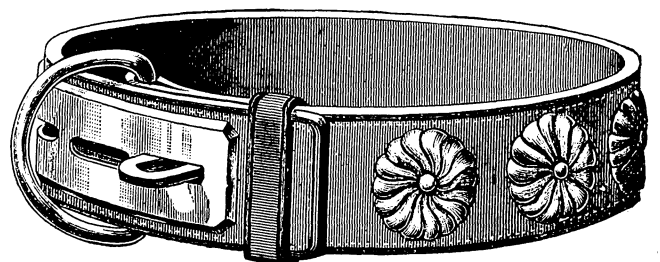
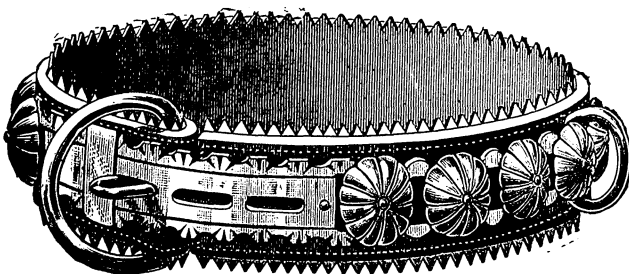
TACKLE BLOCKS.



Side-Walk and Rink

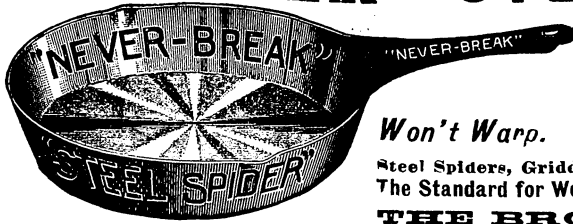
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A Full Line of Dog Collars, Muzzles, Leads, Etc.



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The S. G. & L. CO.
**Tubular Globe
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IS THE Best Street Lamp Manufactured.
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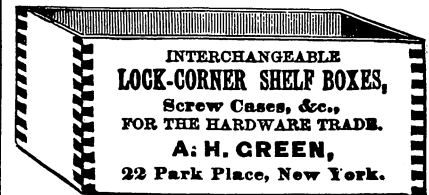
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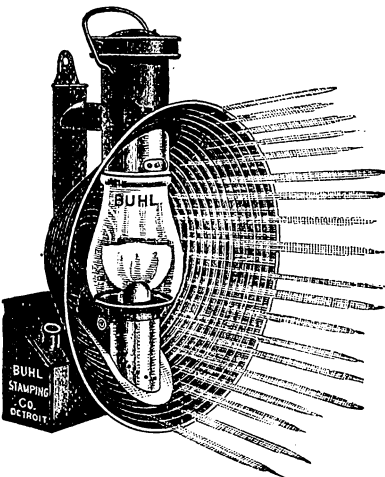
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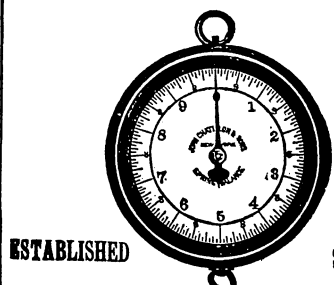
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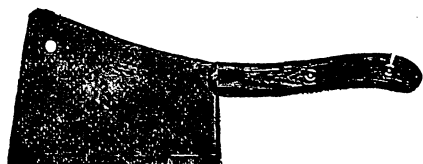
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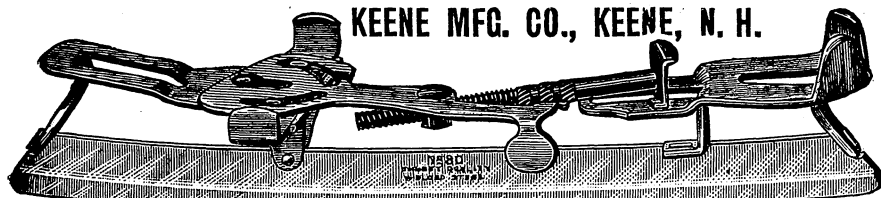
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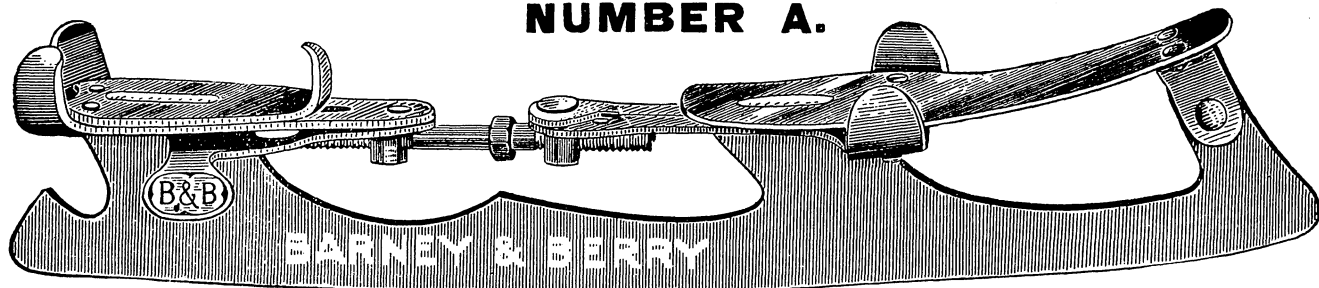
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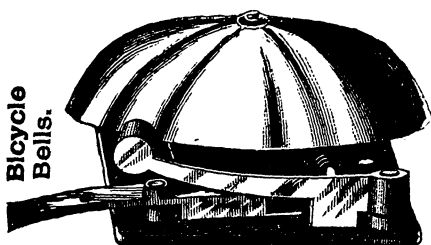
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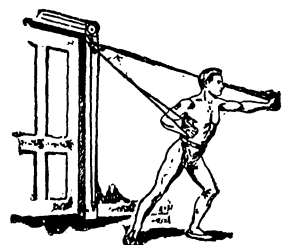
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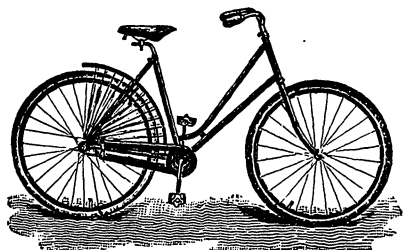
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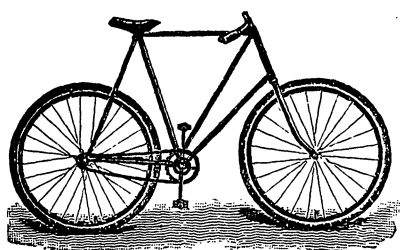




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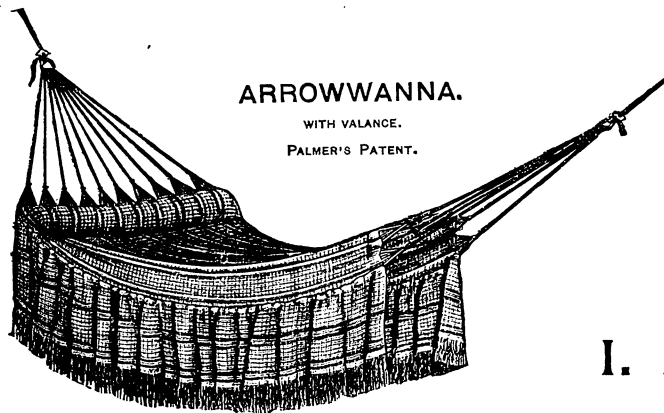
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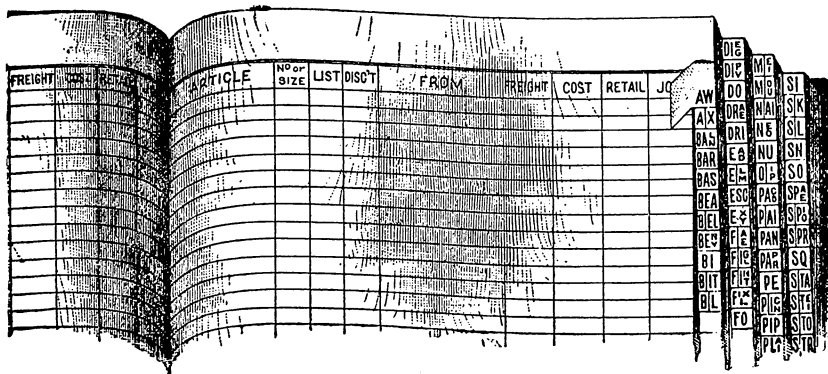
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BA _N	E _D	OP	SP _E
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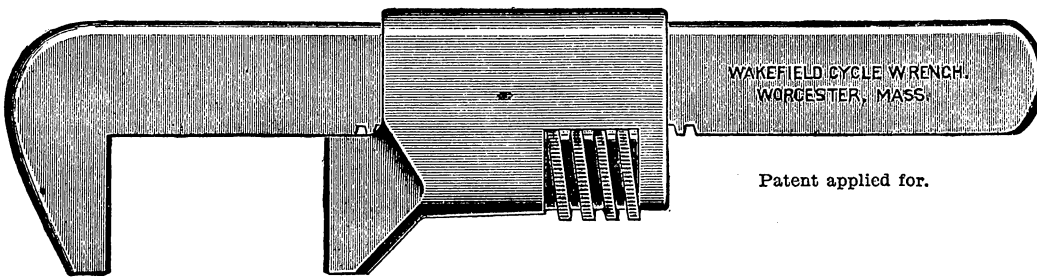
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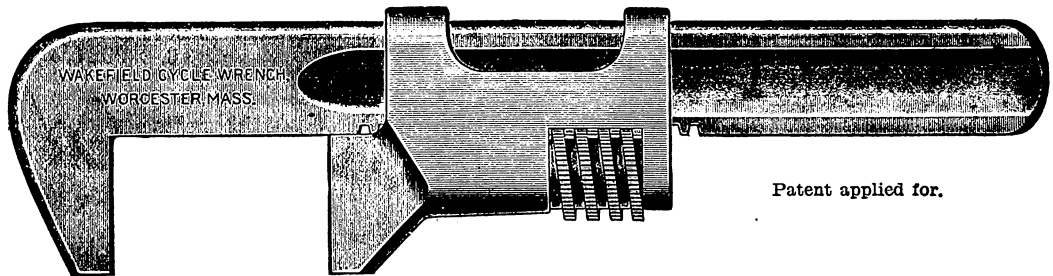
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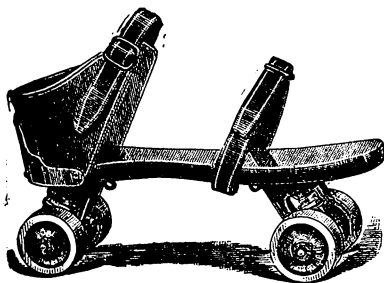
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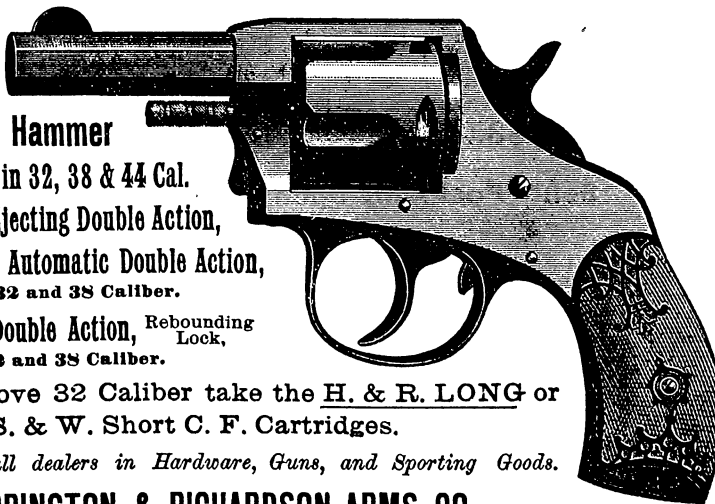
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14 JETS OF LIGHT

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FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas.

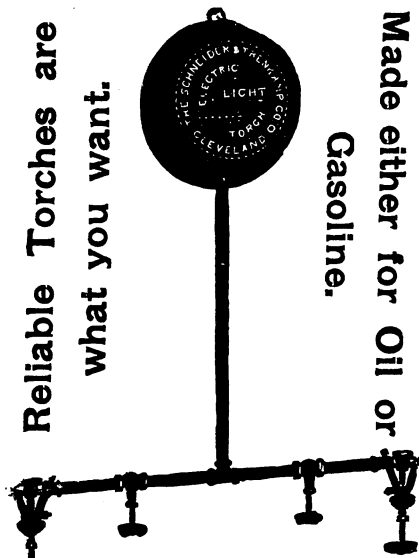
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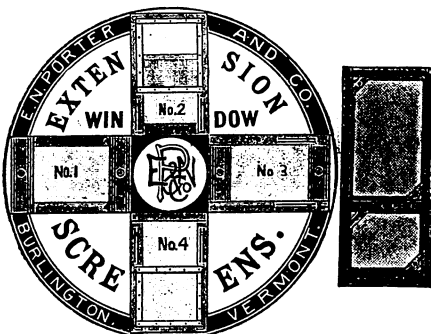
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Reliable Torches are
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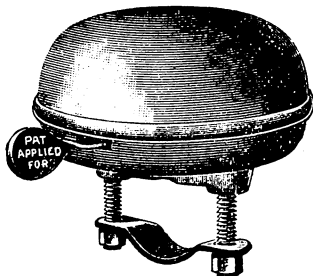
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These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by
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ACME CUTTING TOOLS.

Made in all Sizes.



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Jaws of Choicest Tool Steel, dove-tailed into the head, making it as strong as solid steel.

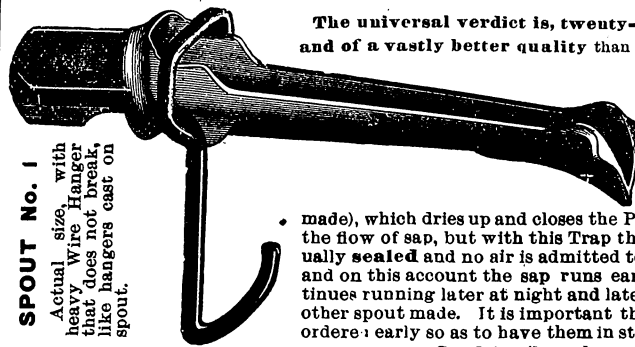
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The only Sap Spout made with a Self Sealing Air Trap, which greatly increases the flow of Sap.



SPOUT No. 1
Actual size, with heavy Wire Hanger that does not break, like hangers cast on spout.

The universal verdict is, twenty-five per cent. more sugar and of a vastly better quality than from any other spout made.

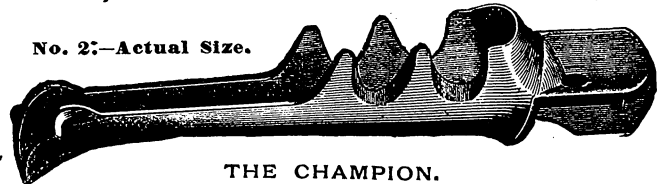
The **Patent Air Trap** is one of the essential features found only in the **Improved Eureka**s, and without which the air would be freely admitted (as it is in all other spouts) made, which dries up and closes the Pores and materially lessens the flow of sap, but with this Trap the discharge hole is effectively sealed and no air is admitted to freeze or dry up the sap and on this account the sap runs earlier in the morning, continues running later at night and later in the season than any other spout made. It is important that these goods should be ordered early so as to have them in stock when the season opens.

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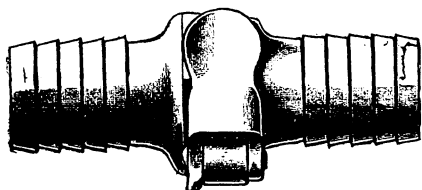
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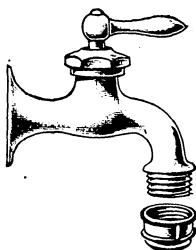
THE ADAMS & WESTLAKE

No. 2. DISCONNECTED. No. 1.

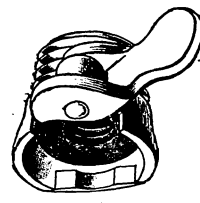


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Nos. 1 and 2 for Fitting New Hose.
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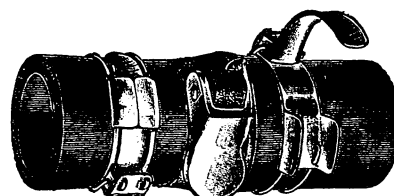
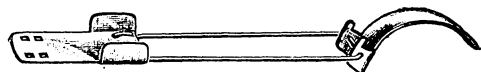


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No Special Tools Required.
QUICK and Effective.

**A GOOD THING—
PUSH IT ALONG.**



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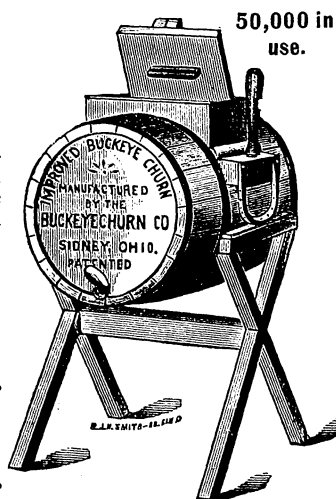
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Large opening. Easy
to clean and work.
No drudgery.

Sold to one Dealer in town only.

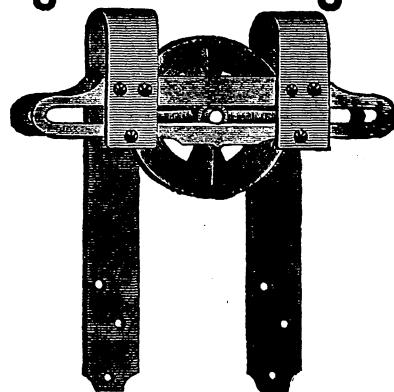
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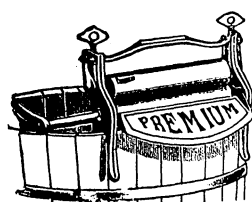
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**Also a Complete Line of this
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MANUFACTURED BY

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COLBY WRINGER CO., - Montpelier, Vt

MANUFACTURERS OF THE

Premium Wringer.

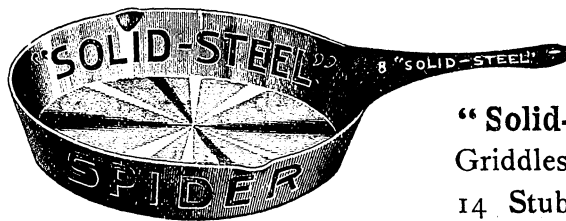
With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, Direct Representatives.

15 Murray Street, New York.

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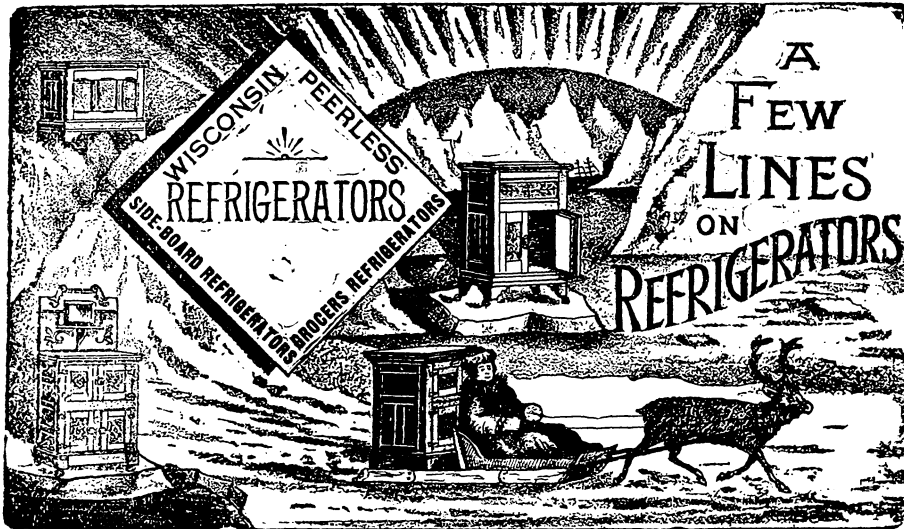
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GRIDDLES,
KETTLES,
SCOTCH BOWLS,
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STEW POTS,
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&c., &c.



"Solid-Steel" Spiders and Griddles are pressed *HOT* from 14 Stubbs' Gauge Steel and guaranteed not to warp.

THE CLEVELAND STAMPING & TOOL CO.,
CLEVELAND, OHIO.

Light and Heavy Stamping and Blanking, Dies and Presses.



FROM DEALERS LOOKING FOR THE Best Refrigerator Made

We solicit an opportunity of presenting the merits of our
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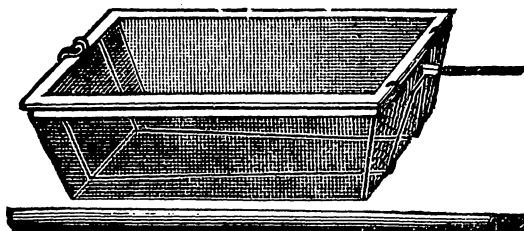
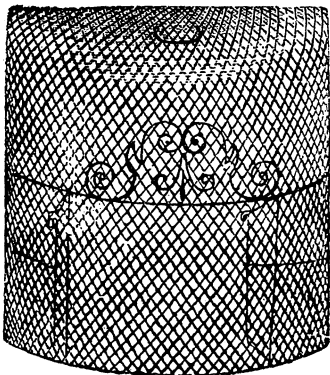
Mineral Wool Filling. Absolutely cleansable. More and better talking points than all other makes combined. Absolute guarantee. Seventh season. For Catalogue address

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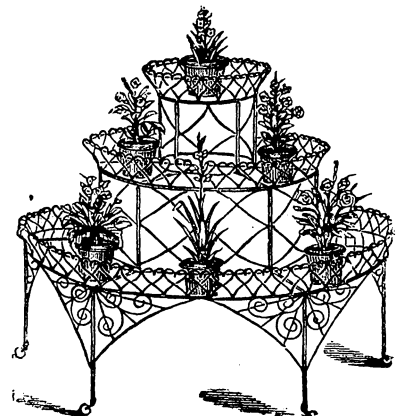


MANUFACTURERS OF

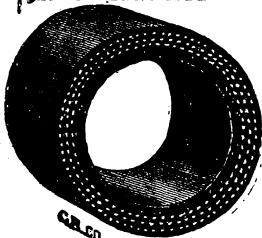
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Sieves, Screens, Bank and Office Wire
Work, Railing of every description.

FIRST CLASS GOODS. LOW PRICES.

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NEW SEAMLESS TUBE



Who Has Not Had Bad Hose?

Who has not lost time, patience, money, by attempting settlement for such goods?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

PATENT SEAMLESS TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers', Cotton Hose, &c.

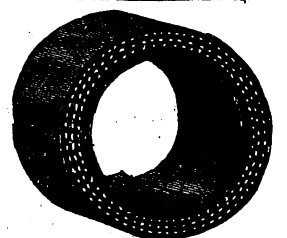
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

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of the Mechanical Rubber Co.,
CLEVELAND, O.

Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

NEW LAPPED TUBE



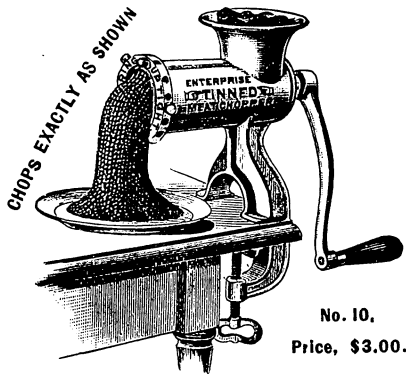
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Seamless-Tube
COTTON RUBBER-LINED HOSE

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Send for 60-page Catalogue.
Write for Prices and Samples.

SALES OF
Over Two Million Feet

GARDEN HOSE

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

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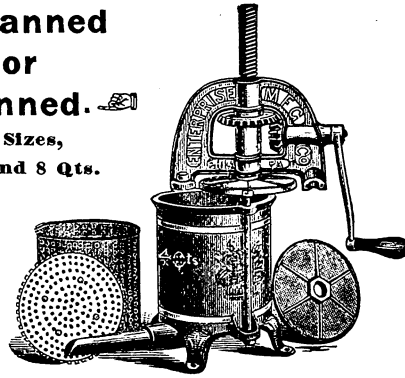
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3 Sizes,
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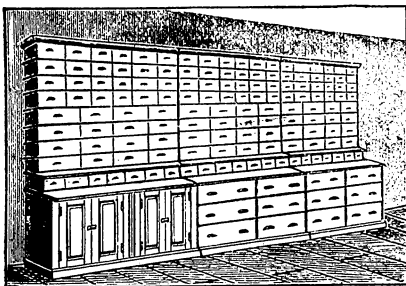
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New York Branch, J. C. McCarty & Co., 97 Chambers St., New York.

For Sale by the
HARDWARE
TRADE.



HARDWARE
DRAWERS.



**THE WERNICKE SYSTEM
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It is new, novel and unequalled for beauty
convenience and economy.

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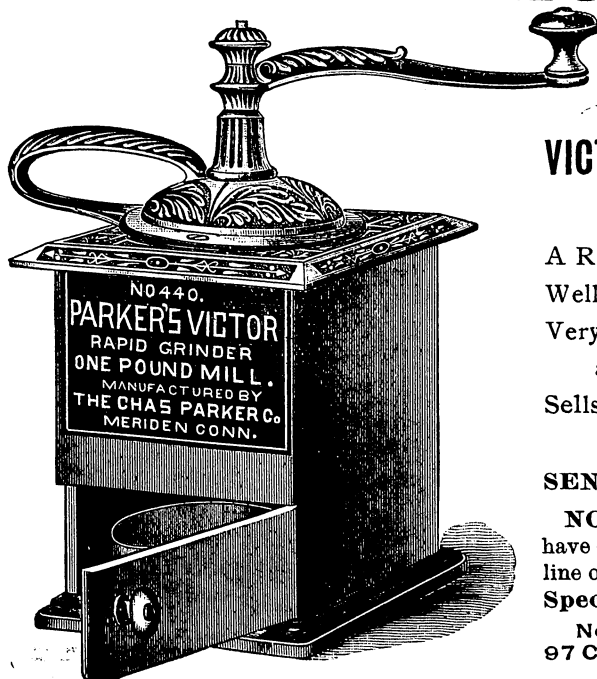
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Manufacturers of General Store, Bank and Office Furniture,

No. 125 WILDER STREET,

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THE CHAS. PARKER CO. MERIDEN
MANUFACTURERS OF
THE PARKER GUN VISES THE PARKER LAMP
WOOD SCREWS NAILS COFFEE MILLS,
CABINET-LOCKS SPOONS &c.



Just The Thing!

**PARKER'S
VICTOR ONE POUND
COFFEE MILL.**

A Rapid Grinder.
Well Made Throughout.
Very Attractive in Appearance.
Sells Readily at a Popular Price.

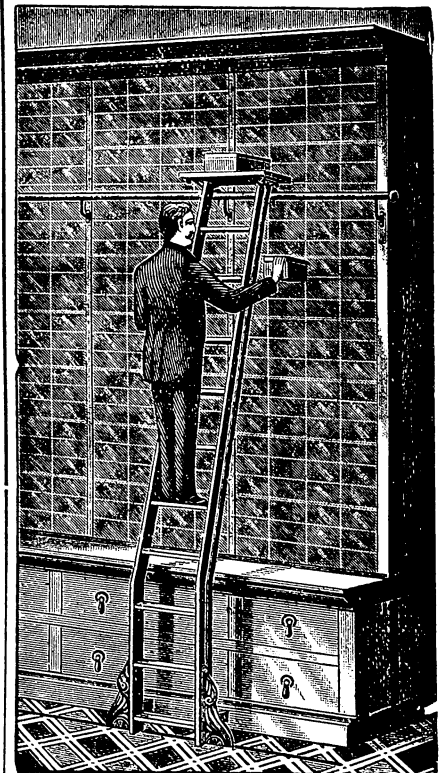
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NOTE.—Every dealer should have our catalogue of extensive line of Standard Hardware Specialties.

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THE BICYCLE STEP LADDER.
Especially adapted for Hardware Stores.



The newest, neatest, simplest, easiest operated and
safest store ladder made. Highest Award World's
Fair. Write us.

The Bicycle Step Ladder Co., 50 State Street,
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IMPROVED MINE LAMP
FOR ANTHRACITE AND
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MINING.

SEAMLESS
BRASS
COLLAR
BRASS HINGE
Lid Solid
No Solder

6
DIFFERENT
STYLES
OF SPOUTS.
SAMPLE 15¢.

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N. R. STREETER & CO.,

Manufacturers of **SAD IRONS AND HARDWARE.**



"SENSIBLE" MINCING KNIVES.

Tempered Steel Nickel-Plated Blades.
Multiple-Bladed Means Rapid Cutting.

These goods have become the
standard of the market.

Our line of Sensible Mincing Knives
covers all points where other Multiple-
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BLADES can be **REMOVED** when they
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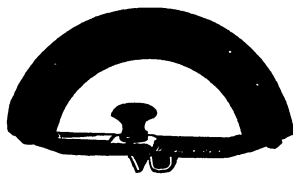
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Factories, Rochester, N. Y., Pottstown, Pa.

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PATENT APPLIED FOR.
The Steel Stretcher Handle,
for Mrs. Potts' Sad Irons,
in Hazel Wood only.
No. 110.

The Cleveland Wood Turning Co.,

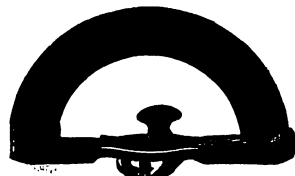
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Special work in Handles and Wood Turning of all
kinds. Our line of regular made Tool Handles is the
best.

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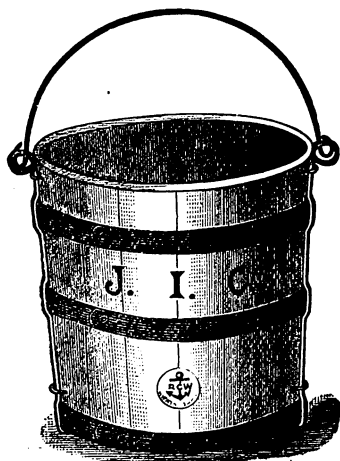
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Walnut, Japanned, No. 1.
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Patented August 26, 1886.

Made of Best Seasoned White Oak or
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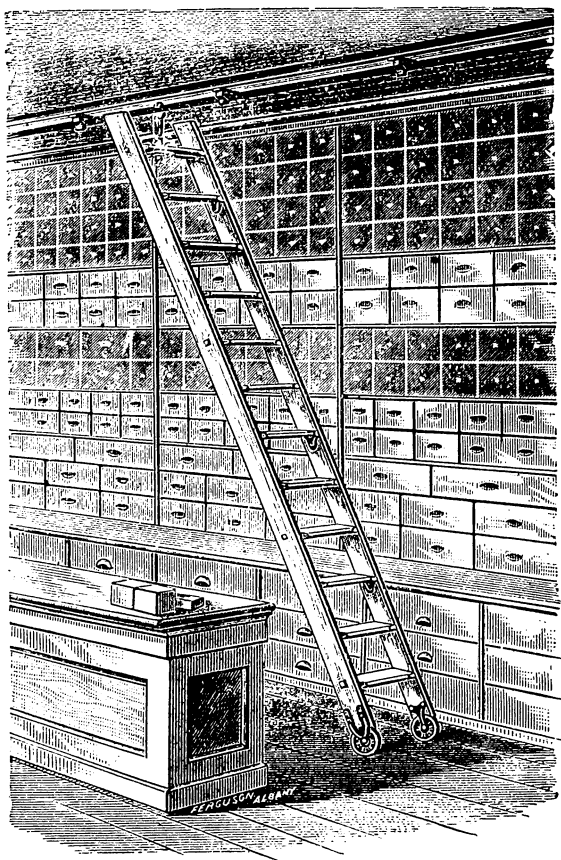
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Hoops cannot come off. Best stable,
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Prices quoted on applica'tion.

RICHMOND CEDAR WORKS,
Manufacturers of Woodenware,
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THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in ap-
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Manufactured by

M. CROISSANT,

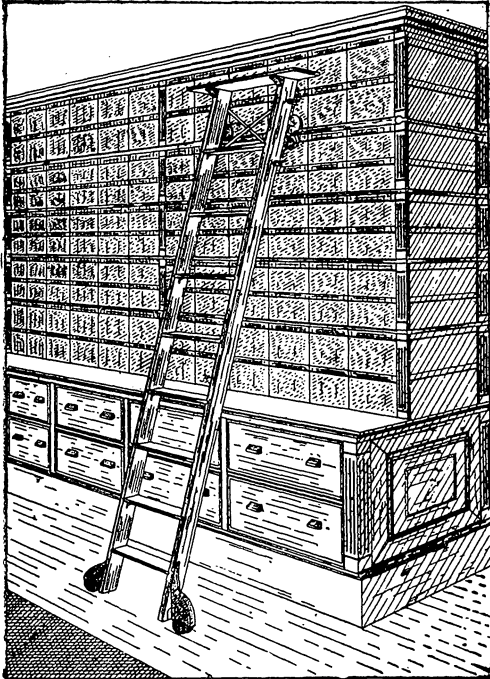
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THE VICTOR DOUBLE TROLLEY STORE LADDER.

WORKS ON A NEW PRINCIPLE. **EASILY.** **NOISELESSLY.** **HANDY** TO USE. **COSTS** SO LITTLE THAT EVERY ESTABLISHMENT CAN AFFORD TO HAVE IT

All orders are sold subject to thirty days' trial and if not satisfactory may be returned at our expense.

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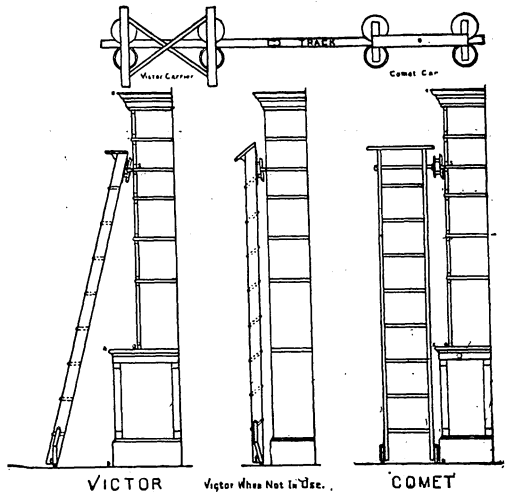
Risk your neck on a barrel.

DON'T

Try to jump with mouth full of screws and hands full of something else.

DON'T

Fail to send for price of Victor Ladders.



COBURN TROLLEY TRACK MFG. CO., HOLYOKE, MASS. ALSO PARLOR, BARN AND FIRE-DOOR HANGERS.

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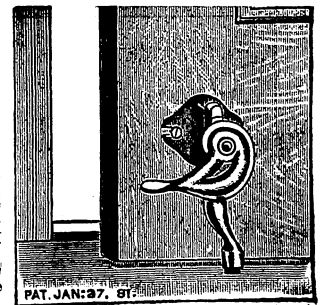
The Blount Door Check and Spring

is acknowledged generally to be the best on the market. Being free from packing friction, and its interior parts self-lubricating, it is easy to open (the only resistance being the tension of the spring), which is a very desirable feature.

The closing and checking power is under direct control and can be quickly adjusted to suit any requirement. They are made in sizes suitable for any doors, and are unequalled in checking power. There are many thousands in use in all the principal cities of the United States, and in other countries. They are recommended by the leading architects everywhere, and once tried are always used. They were awarded a medal for superior merit by the American Institute in New York, 1890, 1891 and 1892, and a silver medal and diploma by the Massachusetts Charitable Mechanic Association, Boston, 1892, and a medal and diploma for superior merit by World's Columbian Exposition, 1893.

THE STANDARD DOOR STOP OR HOLDER. A new, novel, and convenient device for holding doors at any angle desired and operated with the foot. It is almost daily required on public and private doors. Send for circular.

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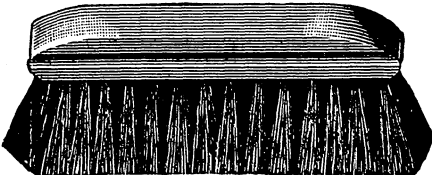
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—MANUFACTURERS OF—



No. 10 Hard Molders' Brush.

No. 3 Soft Molders' Brush.



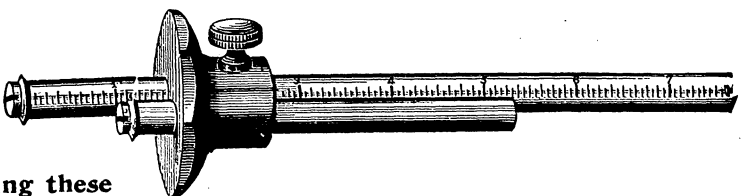
Hard and Soft Molders' Brushes, Steel Wire Casting Brushes, Stable, Shop, Street, Boat and Carpet Brushes, Brooms and Brushes of all kinds.

HIGH GRADE.

LOW PRICED.

CAUTION!

We have purchased all the patents of Barret's Improved Combination Roller Gauge, and caution all parties against buying or selling these Gauges that are not made by us and with our name stamped upon each Gauge. We are able to and shall protect our rights to the full extent of the law.



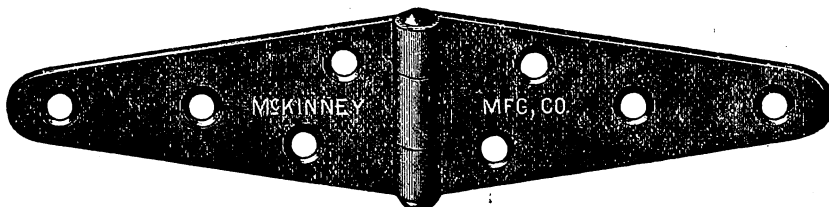
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STEEL HINGES AND BUTTS.

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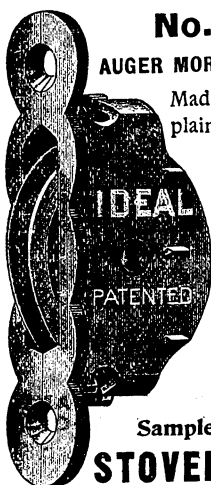
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"NONE BETTER."

Ideal Sash Pulley

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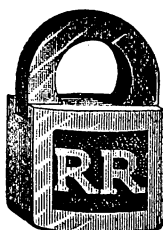


Made with two inch wheel plain and polished, cone axle bearings, noiseless and easy running; markers on the side to lay off the centers to bore the holes by.

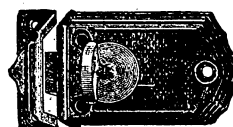
The best and most uniformly made low-priced Sash pulley on the market.

Sample Free.

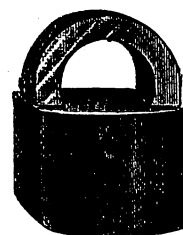
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Our goods are the most desirable in every respect. Send for catalogue and prices of our large and complete line.

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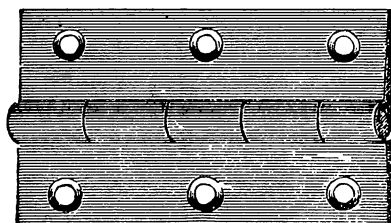
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Office: 813 Masonic Temple, CHICAGO.

WORKS AT MAYWOOD, ILL.



Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

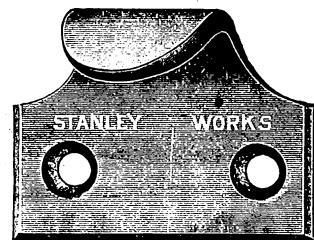
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Nos. 16 & 18 Chambers Street, New York.

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HARDWARE.**

WROUGHT STEEL SASH LIFTS.

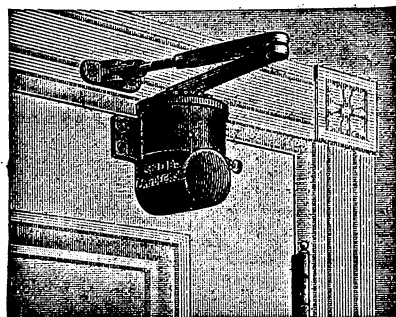


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PRICES ON APPLICATION.

The Stanley Works, New Britain, Conn.
79 Chambers St., N. Y.

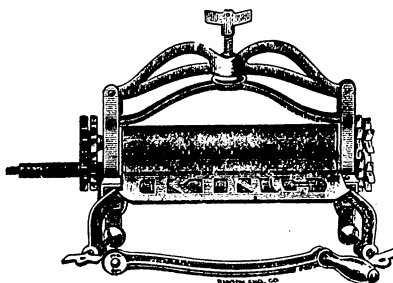
MAKERS OF STEEL BUTTS, HINGES, ETC.



Bardsley's Liquid Door Check and Spring

Perfect in action, durable, neat in appearance, low in price and fully warranted. Responsible Agents wanted in the principal cities.

J. BARDSLEY, 149 & 151 Baxter St., New York.



**We are Sole Manufacturers of the
Celebrated Erie and King Wringers.**

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

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THE NATIONAL WRINGER CO., CANTON, OHIO.

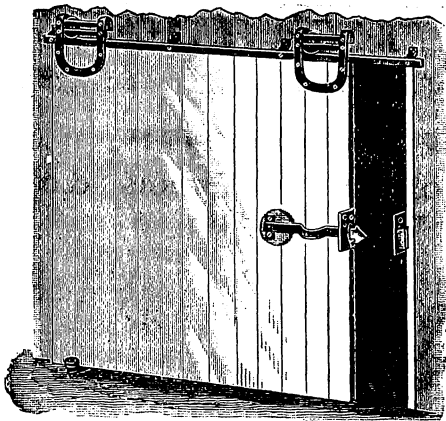
New York Office, 107 Chambers St., John T. Ryan, Mgr.

THE CLARK MFG. CO.,

Blind Hinges, Gate Hinges, Door Butts,

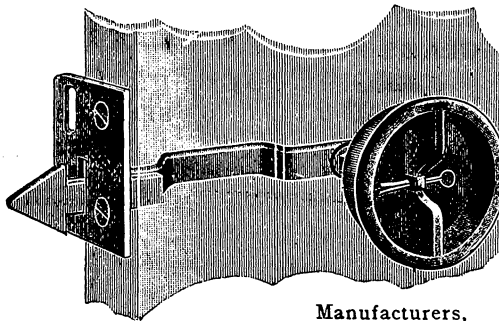
And other HARDWARE SPECIALTIES,

BUFFALO, N. Y.

**Lane's Pat. Barn Door Hanger.**

We were the originators of this style of Hanger. See that you get the genuine.

TRANSPARENCY SHOWING SIDE NEXT THE PARTITION.

**LANE'S SLIDING DOOR LATCH.**

Made of Steel.

One size only and no right or left.

Locks with key if desired.

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Defies Competition for Quality and Price.**PATENT PERFECTION**

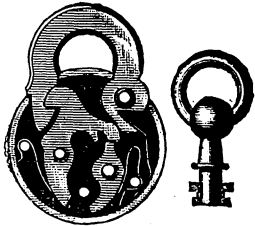
Eight Tumblers. Key turns both ways

PADLOCK.

Sizes, $\frac{1}{4}$ inch to $2\frac{1}{4}$ inches, of cast bronze. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{4}$ and $\frac{5}{8}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

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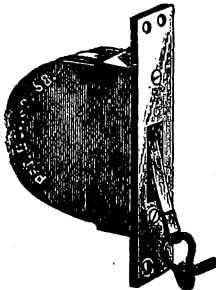
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To buy an inferior article, which your trade condemns, when you can get

THE CALDWELL SASH BALANCE.

The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

CALDWELL MFG. CO., Rochester, N. Y.

**STAR LOCK WORKS, PHILA.**

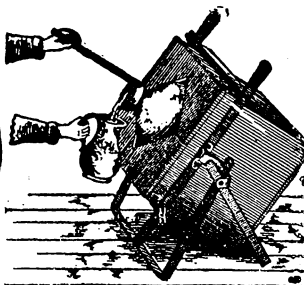
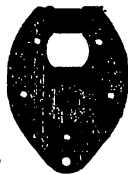
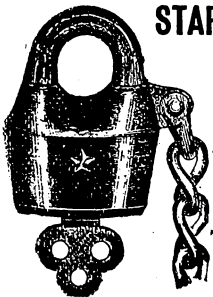
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MANUFACTURERS OF
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SCANDINAVIAN
AND

Spring Padlocks,
Trunk & Case Locks,

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Catalogues Sent on Application.

**WHY USE WOODEN OR HEAVY STEEL BLOCKS**

WHEN THE STEEL AND IRON

TACKLE BLOCKS

—MADE BY—

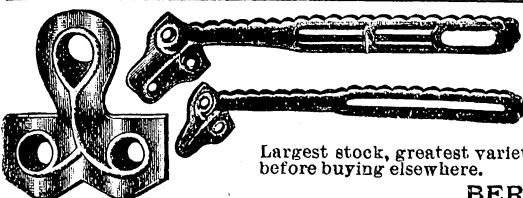
The Cleveland Block Co.,

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ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

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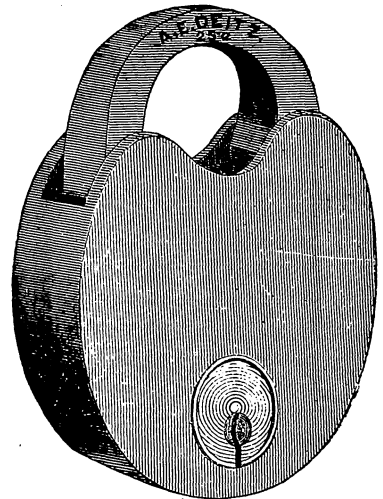


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Largest stock, greatest variety. Prices lower than ever. Write us before buying elsewhere.

BERGER BROS., Philadelphia.

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J. C. McCARTY & CO., Agents,
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Factory, **BROOKLYN, E. D., N. Y.**

SASH WEIGHTS

E. E. BROWN & CO.,

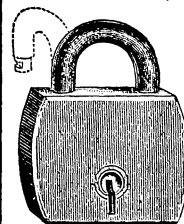
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ESTABLISHED 1879.

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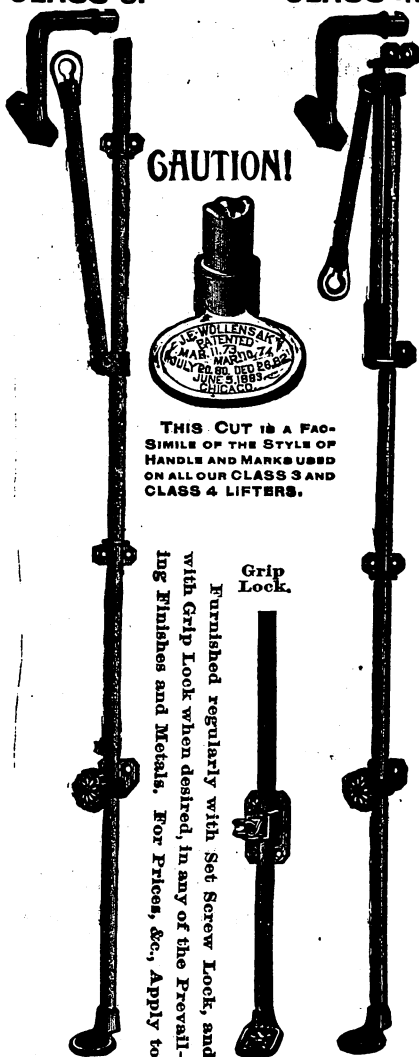
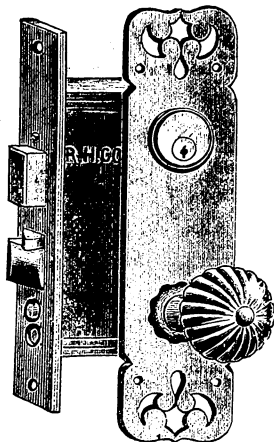
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Originators, designers, patentees and manufacturers of all leading popular styles of active selling Key-locking and self-locking Scandinavian, Railroad, Switch and Automatic Padlocks, 175 Different kinds. The largest padlock factories in the world. Our new 126 page catalogue furnished the trade on application.

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LOCKS**

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BRONZE**GOODS**

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NEW**DESIGNS.****READING****HARDWARE COMPANY,**

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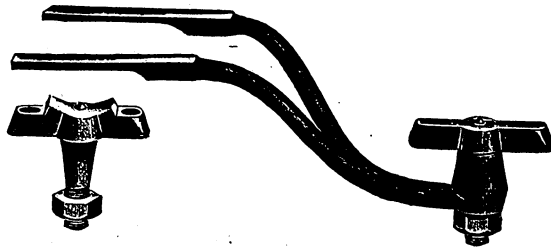
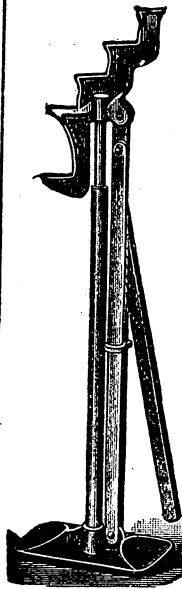
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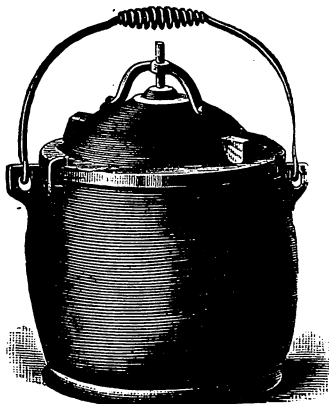
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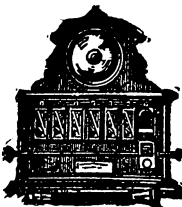
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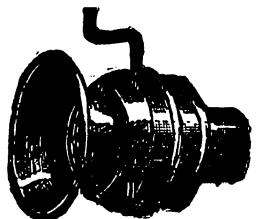
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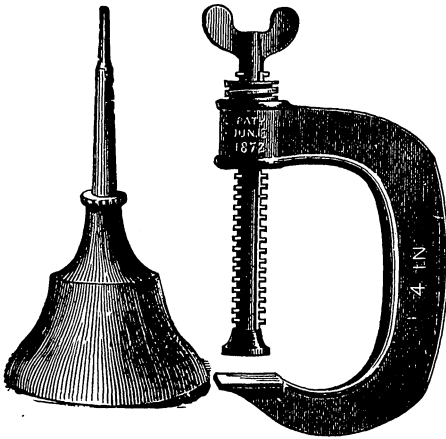
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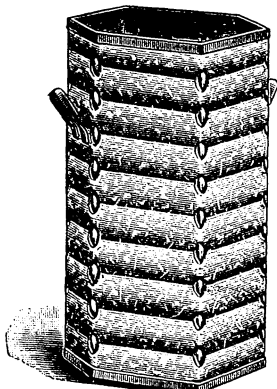
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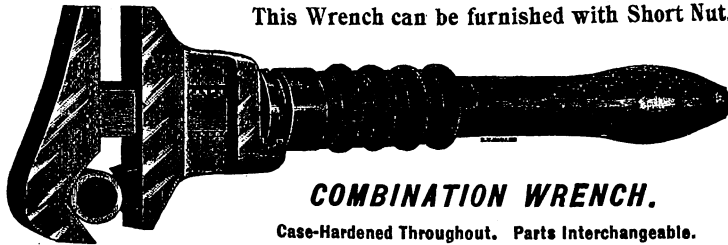
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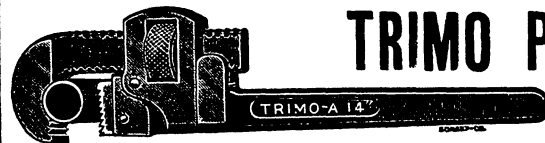


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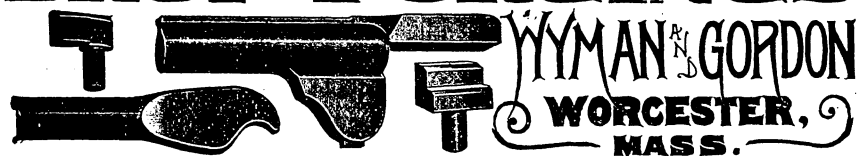
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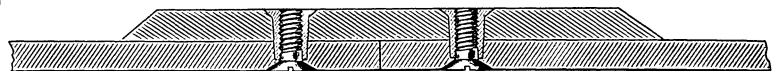
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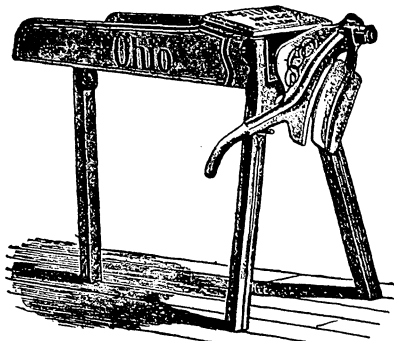
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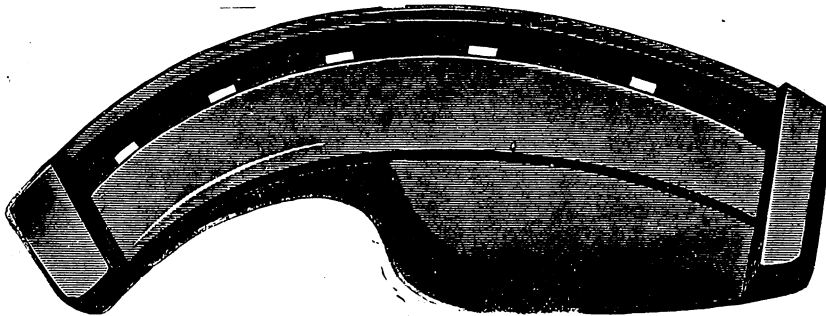
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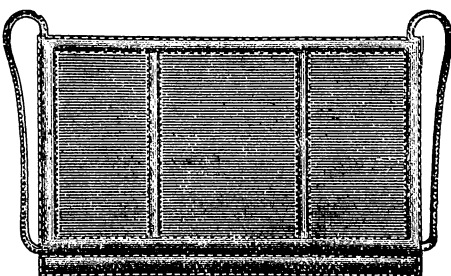
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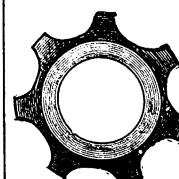
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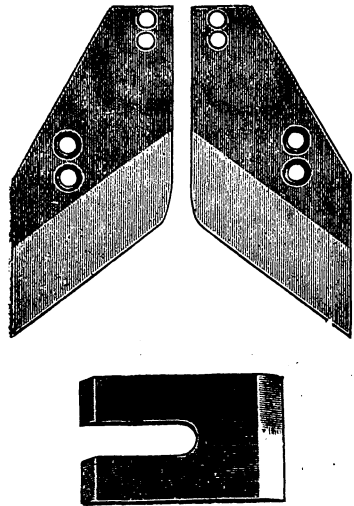
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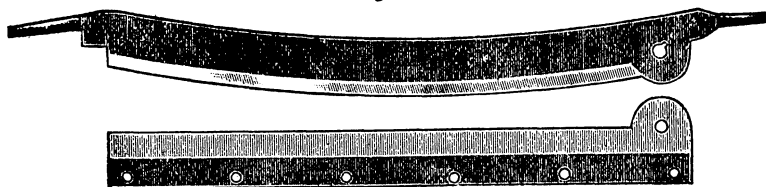


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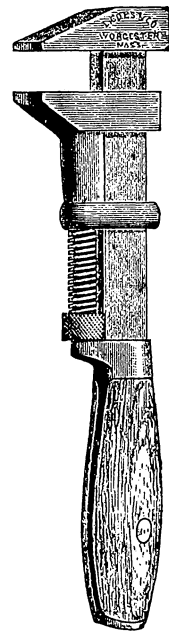
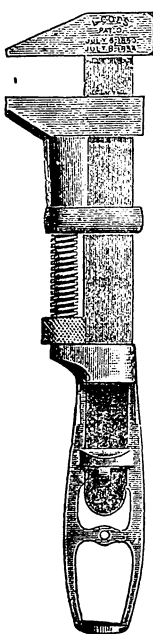
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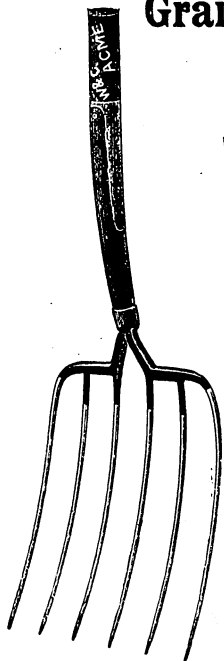
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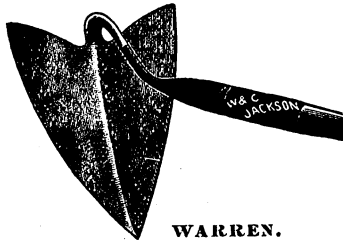
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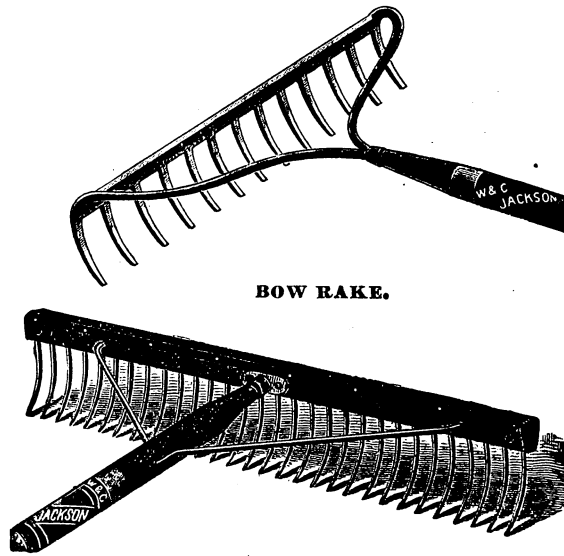
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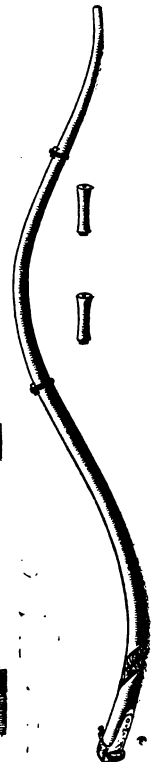


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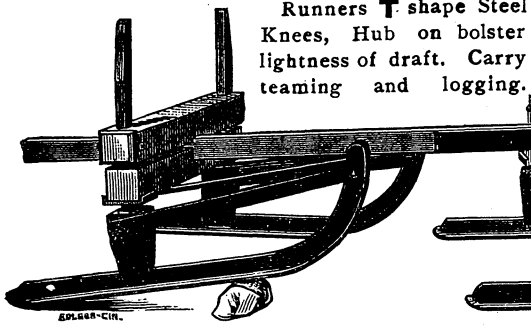
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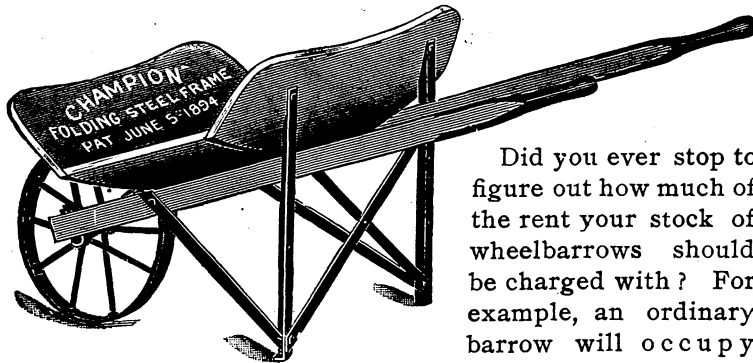
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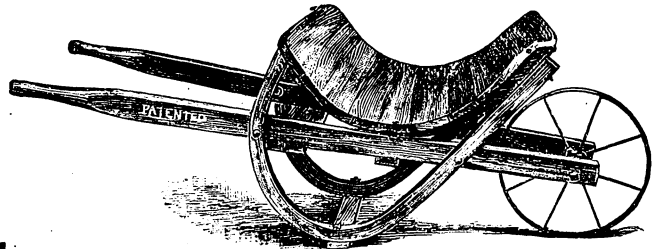
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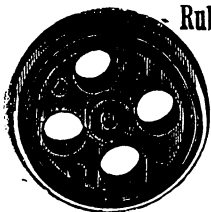
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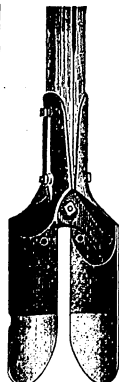
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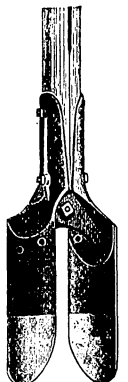
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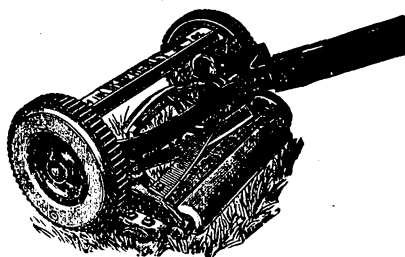
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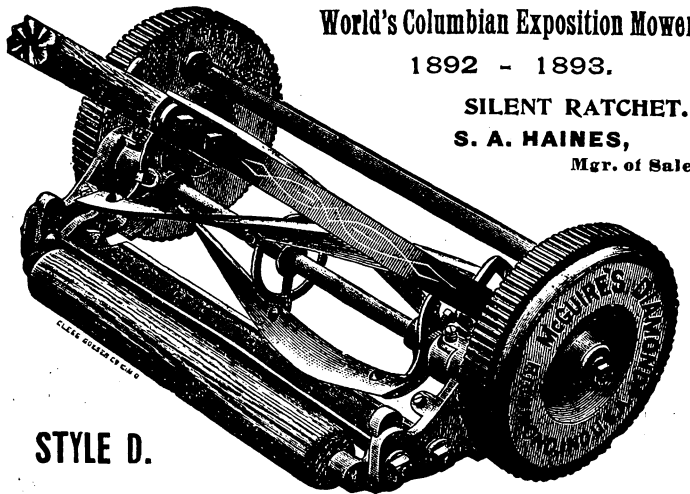
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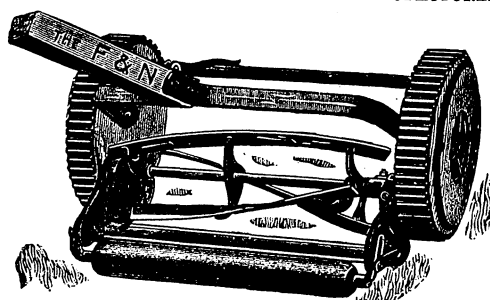
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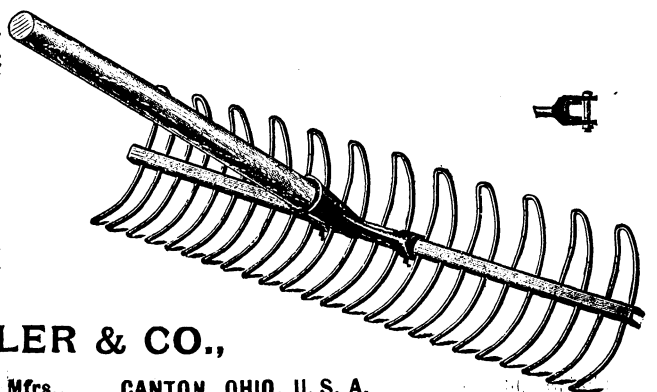
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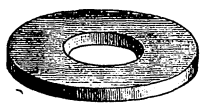


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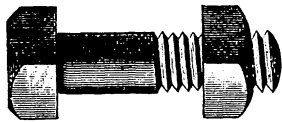
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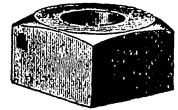
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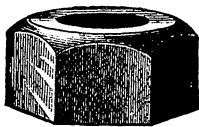
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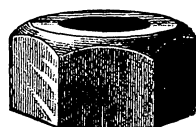


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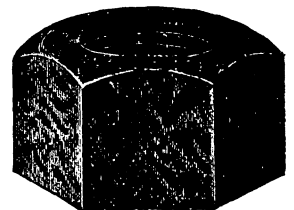
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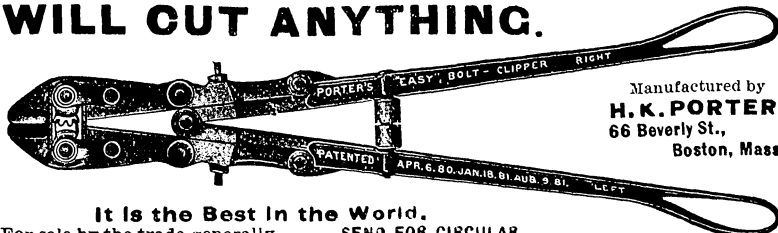
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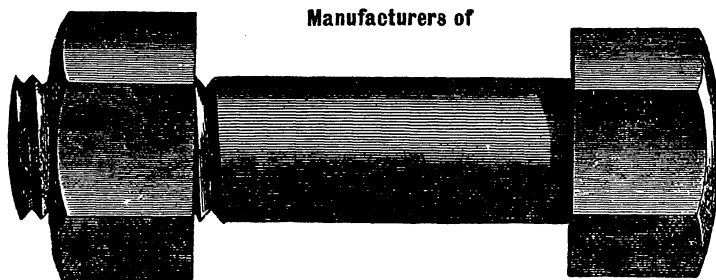
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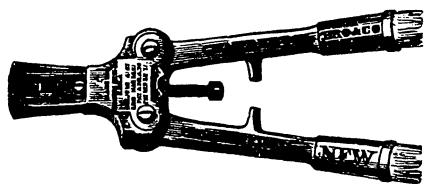
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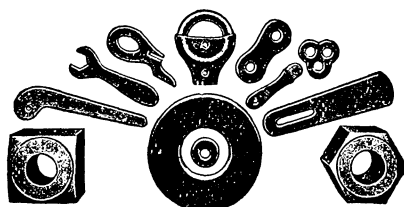
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Wilcox & Howe, Birmingham, Conn.

Cartridge Reloading Tools.
Ideal Mfg. Co., New Haven, Conn.

Carvers' Tools.
White, Van Glahn & Co., 15-17 Chat ham Square, N. Y.

Cash Tillis.
Morford Register Co., Allentown, Pa.

Casters, Wheel, &c.
Clark G. P., Windsor Locks, Conn.

Castings, Iron and Steel.
Allentown Hdw. Wks. Allentown, Pa.
Booth, The Lloyd Co., Youngstown, O.
Boston Casting Co., So. Boston, Mass.
The Burr & Houston Co., Brooklyn, N. Y.
Coney, S. & Son, Manlius, N. Y.
Chatter Steel Casting Co., Phila.

Chrome Steel Works, Brooklyn, N. Y.
Flagg, Stanley G. & Co., Phila.
Garland Foundry Co., Cleveland, O.
Haight & Clark, Albany, N. Y.
Palmer & De Mooy Fdry. Co., Cleveland, O.

Parsons, R. E. Co., Bridgeport, Conn.
Pratt & Cady Co., Hartford, Conn.
Sessions Foundry Co., Bristol, Conn.
Shickle, Harrison & Howard Iron Co., St. Louis, Mo.

Spencer's I. S. Sons, Guilford, Conn.
Standard Fdy. & Mfg. Co., Cleveland, O.
Torrance Iron Co., Troy, N. Y.
Union Lock & Hdw. Co., Lancaster, Pa.
Walker Mfg. Co., Cleveland, Ohio.
Wetherill, Robert & Co., Chester, Pa.
Wilcox, Crittenden & Co., Middletown Conn.

Castings, Malleable.
Arcade Malleable Iron Co., Worcester, Mass.
Hammer & Co., Branford, Conn.
Torrance Iron Co., Troy, N. Y.

Catalogue Files.
Folding Paper Box Co., So. Bend, Ind.

Chains.
Bradlee & Co., Philadelphia.

Garfield Chain Co., Rankin, Pa.
Link Belt Engineering Co., Phila., Pa.
McKay, Jas. & Co., Pittsburgh, Pa.

Check Punch.
Hogson & Pettis Mfg. Co., New Haven, Conn.

Chimneys.
Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.
Cushman Chuck Co., Hartford, Conn.
Skinner Chuck Co., New Britain, Conn.
Smith & Egge Mfg. Co., Bridgeport.
Union Mfg. Co., 103 Chambers, N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Churns.
Buckeye Churn Co., Sidney, Ohio.

Clamps.
Hammer & Co., Branford, Conn.
Le Count, C. W., So. Norwalk, Conn.

Cleavers and Choppers.
Plumb, Fayette R., Phila., Pa.

Clipping Machines.
Gillette Clipping Machine Co., 201 E. 23d Street, N. Y.

Coal.
Barns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coat and Hat Hooks.
Am. Wire Goods Co., Lowe 1, Mass.

Coffee Mills.
Enterprise Mfg. Co., Phila., Pa.
Parker, Chas. Co., Meriden, Conn.

Coke.
Barns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Ratney, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.
Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.
Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.
Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wister, Francis, Philadelphia, Pa.

Copper, Sheet.
Cramp Metal Mfg. Co., Olney, Phila., Pa.

Cordage.
Samson Cordage Works, Boston, Mass.

Cork Screws.
Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.
Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.
Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.
Durant, W. N., Milwaukee, Wis.

Cranes.
Marls & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Whiting Foundry Equipment Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Ct.

Cupolas, Hot Blast.
Byram & Co., Detroit, Mich.
Whiting Foundry Equipment Co., Chicago, Ill.

Curry Combs.
N. Y. Stamping Co., Brooklyn, N. Y.

Cutlery, Importers of.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.
Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Cutlery Display Cases.
Union Show Case Co., Chicago, Ill.

Dashes and Fenders.
McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Dies.
Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Dog Collars.
Union Hardware Co., Torrington, Ct.

Door Checks and Springs.
Bardsley, J., 149 & 151 Baxter St., N. Y.
Blount Mfg. Co., Boston, Mass.

Drilling Machines.
Beaman & Smith, Providence, R. I.
Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Dallett, Thos. H. & Co., Philadelphia.
D'Amond & Littleale 204 E. 13d St., N. Y.
Dietz, Schumacher & Co., Cincinnati.
Dwight Slate Machine Co., Hartford, Conn.

Goddard, Asa, Worcester, Mass.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Herlick & Cowell, New Haven, Conn.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Woodward & Rogers, Hartford, Conn.

Drop Forgings.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Bonton, N. J.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, E. D.
R. I. Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Wilcox & Howe Co., Birmingham, Conn.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.
Miner & Peck Mfg. Co., New Haven, Conn.

Stiles & Parker Press Co., Brooklyn, N. Y.
Vineland Forge Works, Vineland, N. J.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Waiters.
Hutchinson, F. S. Co., 32 Warren St., N. Y.
Storm Mfg. Co., Newark, N. J.

Dynamite.
New York Powder Co., 62 Liberty St., N. Y.

Dynamos.
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Cutter, Wood & Stevens, Boston, Mass.
Eddy Electric Mfg. Co., Windsor, Conn.
Zucker & Levett & Loeb Co., 10 to 14 Grand St., N. Y.

Edge Tools, Makers of.
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
Plumb, Fayette R., Philadelphia, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

- Egg Beaters.**
North Bros. Mfg. Co., Philadelphia, Pa.
- Electric Bells and Supplies.**
Ostrand, W. R. & Co., 204 Fulton St., New York.
Taylor Battery Co., 59 Cortlandt St., N.Y.
Wollensak, J. F., Chicago, Ill.
- Electric Dynamo Machines.**
Hanson & Van Winkle Co., Newark, N.J.
- Elevator Buckets.**
Clark, W. J. & Co., Salem, O.
- Elevators, Makers of.**
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Penna. Elevator Engineering Co., Phila.
Warner Elevator Mfg. Co., Cincinnati, O.
- Emery and Emery Wheels.**
Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R.I.
W. Y. Belling & Packing Co., Ltd., N.Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., N.Y.
Tantle Co., Stroudsburg, Pa.
- Emery Wheel Dressers.**
Bay State Stamping Co., Worcester, Mass.
- Engineers and Contractors.**
Aiken, Henry, Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N.Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amel & Co., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines, Gas and Gasoline.**
Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Springfield Gas Engine Co., Springfield, O.
Sumner, H. W., Covington, Ky.
- Engines, Steam, Makers of.**
Allis, E. P. Co., Milwaukee, Wis.
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Chandler & Taylor Co., Indianapolis, Ind.
Fischer Fdry. & Mch. Co., Pittsburgh, Pa.
Harris, Wm., Steam Engine Co., Providence, R.I.
Lane & Bodley Co., Cincinnati, Ohio.
Norwalk Iron Works Co., So. Norwalk, Conn.
Phila. Engineering Works, Phila., Pa.
Southwick Foundry & Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Westwick, Jno. & Son, Galena, Ill.
Wetherill, Robt. & Co., Chester, Pa.
- Exerciser.**
Independent Electric Co., Chicago, Ill.
- Expansion Bolts.**
Boone, W. C. Mfg. Co., Boonton, N.J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.
- Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N.Y.
- Faucets, Wooden, Makers of.**
John Sommer's Son, Newark, N.J.
- Feed-Water Heaters and Purifiers.**
Davis, I. B. & Son, Hartford, Conn.
Harrison Safety Boiler Works, Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N.J.
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**
Barnum, E. T., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Champion Iron Co., Kenton, O.
Chess Bros., Pittsburgh, Pa.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St.
Kilmer Mfg. Co., Newburgh, N.Y.
McCallip Fence & Wire Wks., Columbus, Ohio.
The Van Dorn Iron Works Co., Cleveland, O.
- Files, Importers of.**
Moss, F. W., 80 John St., N.Y.
- Files and Rasps, Manufacturers of.**
Arcade File Works, Anderson, Ind.
Banker & White, Troy, N.Y.
Barnett, G. & H., 41 & 43 Richmond, Phila.
McCattrey File Co., Philadelphia.
Nicholson File Co., Providence, R.I.
- Fire Brick, Makers of.**
Bornger, Cyrus, Philadelphia, Pa.
Dover Fire Brick Co., Cleveland, O.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons, foot E. Houston St., N.Y.
Maurer, H. & Son, 420 E. 23d, N.Y.
Ostrand Fire Brick Co., Troy, N.Y.
Valentine, M. D. & Bro. Co., Woodbridge.
- Fire Doors.**
Berlin Iron Bridge Co., E. Berlin, Conn.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Fishing Tackle.**
Dame, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**
Meyers, Fred, J. Mfg. Co., Hamilton, O.
- Fodder Cutters.**
Iyer Mfg. Co., Salem, O.
- Forges, Portable, &c.**
Buffalo Forge Co., Buffalo, N.Y.
Champion Blower & Forge Co., Lancaster, Pa.
Foos Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N.Y.
- Forks, Hay and Manure.**
Iowa Farming Tool Co., Ft. Madison, Iowa.
Withington & Cooley Mfg. Co., Jackson, Mich.
- Foundry Facings.**
Dixon, Jos., Crucible Co., Jersey City, N.J.
S. Obermayer Co., Cincinnati, O.
Smith's Pattern Works, Akron, Ohio.
- Foundry Riddles.**
Estey, W. S., 65 Fulton, N.Y.
- Foundry Supplies.**
S. Obermayer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N.H.
Smith, J. D., Fdy. Supply Co., Cin., O.
- Friction Clutches.**
Brown, A. & F., 17 Day St., N.Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Gages.**
Leavitt Mch. Co., Orange, Mass.
- Galvanized Material.**
Jersey City Galvanizing Co., 112 John St., N.Y.
- Galvanizing and Tinning.**
Wilcox, Crittenden & Co., Middletown, Conn.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Leavitt Mch. Co., Orange, Mass.
Pancoast, Henry B. & Co., Phila., Pa.
- Gear Cutters.**
D. E. Whiton Mach. Co., New London, Ct.
- Gears.**
Boston Gear Works, Boston, Mass.
Lincoln Iron Works, Rutland, Vt.
Poele, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N.Y.
- Glass Boards.**
Canton Saw Co., Canton, O.
Luffkin Rule Co., Saginaw, Mich.
- Glass Cutters.**
Monce, S. G., Bristol, Conn.
- Glaziers' Points.**
Shelton Co., Birmingham, Conn.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.
- Grinding Mills.**
Foos Mfg. Co., Springfield, O.
- Grinding and Polishing Machines.**
Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R.I.
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester, Mass.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
Grafton Stone Co., Grafton, Ohio.
- Gun Implements.**
Bridgeport Gun Implement Co., 313 315 Broadway, N.Y.
Union Hdw. Co., Torrington, Conn.
- Gunpowder, Makers of.**
Lafin & Rand Powder Co., 29 Murray St., N.Y.
- Gymnasium Supplies.**
Independent Electric Co., Chicago, Ill.
- Hammocks.**
Palmer, I. E., Middletown, Conn.
- Handles.**
Cleveland Wood Turning Co., Cleveland, O.
- Hangers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Coursa Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N.Y.
- Hardware Commission Merchants.**
Jacobus, W. H., 80 Chambers, N.Y.
- Hardware Drawers.**
Wernicke Co., Minneapolis, Minn.
- Hardware Jobbers.**
White, Van Gland & Co., 15-17 Chat ham Square, N.Y.
- Hardware Manufacturers.**
Allentown Hardware Works, Allentown, Pa.
Cort Mfg. Co., West Troy, N.Y.
Miller Falls Co., 93 Reade St., N.Y.
Parker, Chas. Co., Meriden, Conn.
Stearns, E. C. & Co., Syracuse, N.Y.
Streeter, N. R. & Co., Groton, N.Y.
Supplee Hdw. Co., Phila., Pa.
Union Mfg. Co., 103 Chambers, N.Y.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers
Sickles, Sweet & Lyon, 35 Barclay, N.Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Borner Bros., Philadelphia, Pa.
Clark Mfg. Co., Buffalo, N.Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Gwiner Mfg. Co., Hamilton, O.
Johnson, S. C., Racine, Wis.
North Bros. Mfg. Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Scranton & Co., New Haven, Conn.
Union Lock & Hdw. Co., Lancaster, Pa.
Wilson, J. Fred, Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N.Y.
Coverts' Saddlery Wks., Farmer, N.Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Tools.**
Myers, F. E. & Bro., Ashland, O.
- Hoes.**
Withington & Cooley Mfg. Co., Jackson, Mich.
- Hog Rings and Ringers.**
Oakes & Irwin, Decatur, Ill.
- Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Brown Holsting & Conveying Mch. Co., Cleveland, Ohio.
Byers, Jno. F. Mch. Co., Ravenna, O.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lidgerwood Mfg. Co., 96 Liberty, N.Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 26 Warren St.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N.Y.
Spedel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, Ohio.
Stuart & Peterson Co., Phila., Pa.
- Horse Clippers.**
Gillette Clipping Machine Co., 201 E. 23d St., N.Y.
- Horse Nails, Makers of.**
Capewell Horse Nail Co., Hartford, Ct.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**
Bryden Horse Shoe Co., Catsauqua, Pa.
Burden Iron Co., Troy, N.Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Leonard, J. & Co., West St., N.Y.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N.Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.
- Hose.**
Cleveland Rubber Works, Cleveland, O.
N. Y. Beiting & Packing Co., Ltd., 15 Park Row, N.Y.
- Hose Coupler.**
Adams & Westlake Co., Chicago, Ill.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N.Y.
- Hydraulic Forging.**
U. S. Projectile Co., Brooklyn, N.Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N.Y.
McCoy, Jos. F. Co., 26 Warren St., N.Y.
- Hydraulic Machinery.**
Wood, Wm. H., Media, Pa.
- Ice Cream Freezers.**
Clement & Dunbar, Phila., Pa.
White Mountain Freezer Co., Nashua, N.H.
- Injectors.**
Fynon-Evans Mfg. Co., Philadelphia, Pa.
Hartford & Co., New York.
Sherwood Mfg. Co., Buffalo, N.Y.
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N.Y.
- Iron Commission Brokers.**
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N.Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. & Co., Phila. & N.Y.
Lea, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. & Co., Phila., Pa.
- Iron Ore.**
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N.Y.
Corning, Edw. & Co., 29 B'way, N.Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Cunliffe, R. M., Phila., Pa.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 440 West St., N.Y.
Nicolis, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N.Y.
- Pierson & Co., 29 Broadway, N.Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 86 B'way, N.Y.
Whitney, A. R. & Co., 17 B'way, N.Y.
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott, Wheelock & Co., N.Y. and Boston.
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.
- Japanning.**
Smith, Theo. V., 54 John St., N.Y.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladies.**
Whiting Fdy. Equipment Co., Chicago, Ill.
- Lanterns.**
Bull Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N.Y.
- Lasts.**
Kupferle, Jno. C., St. Louis, Mo.
- Lathes.**
Beaman & Smith, Providence, R.I.
Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H. Jr., & Co., Phila., Pa.
Jones & Lamson Mch. Co., Springfield, Vt.
New Haven Mfg. Co., New Haven, Conn.
Rhodes, L. E. Co., Hartford, Conn.
Sebastian Lath Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N.Y.
- Lathing, Expanded Metal.**
Chess Bros., Pittsburgh, Pa.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N.J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.**
Anderson, F. S. & Co., Richmond, Ind.
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N.Y.
Coldwell Lawn Mower Co., Newburgh, N.Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.
- Lawn Sprinklers.**
Blair Mfg. Co., Springfield, Mass.
McGowan, John H. Co., Cincinnati, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R.I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Richardson, C. F. & Son, Athol, Mass.
- Locks and Knobs, Manufacturers of.**
Deltz, A. E., 97 Chambers, N.Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Yale & Towne Mfg. Co., Stamford, Ct.
- Lubricants.**
Dixon, Jos., Crucible Co., Jersey City, N.J.
- Machinery.**
Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Beaman & Smith, Providence, R.I.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Day, N.Y.
Bisnal & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N.Y.
Briggs, Marvin, 12 Broadway, N.Y.
Bullard Mch. Tool Co., Bridgeport, Ct.
Carlin's Sons, Tocco, Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N.Y.
Cross & Speirs Mch. Co., Waterbury, Conn.
Dietz & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Light & Canal Sts.
Gould & Eberhardt, Newark, N.J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Hartford Machine Screw Co., Hartford, Conn.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N.Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 68 Cortlandt, N.Y.
Machinists' Supply Co., Rochester, N.Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N.J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N.Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Place, Geo., 145 Broadway, N. Y.
 Pond, L. W. Mch. Co., Worcester, Mass.
 Pools, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfer's Sons, L. F., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Walker Mfg. Co., Cleveland, O.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacturers.

Att. Jno. & Son, New Haven, Conn.

Machine Knives.

Loring Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.

Machine Screws.

American Iron & Bolt Co., Cincinnati, Ohio.
 Hubbell, Harvey, Bridgeport, Ct.
 Rhode Island Tool Co., Providence, R. I.

Machine Tools.—See Machinery.

Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S. Co., Athol, Mass.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.

Manufacturing Sites.

Chicago, Milwaukee & St. Paul R. R. Chicago, Ill.

Measuring Tapes.

Lufkin Rule Co., Saginaw, Mich.

Meat Choppers.

Enterprise Mfg. Co., Philadelphia, Pa.

Meat Cutters.

North Bros. Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.

Correspondence School of Mechanics, Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metal Saws.

Q. & C. Co., Chicago, Ill.

Metallurgists.

Britton, J. Blodgett, Phila., Pa.

Mining Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.

Mine Lamps.

Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
 Snyder, J. L., Plymouth, Pa.

Mining Screws.

Harrington & King Perforating Co., Chicago, Ill.

Mining Machinery.

Allis, E. F. Co., Milwaukee, Wis.

Models, Makers of.

Ideal Machine Works, Hartford, Conn.

Molding Sand.

Obernayer, S. Co., Cincinnati, O.

Motors, Water and Electric.

C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
 Taylor Battery Co., 79 Cortlandt St., N. Y.

Nail Keg Stock.

Crescent Mfg. Co., Detroit, Mich.

Nail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nail and Tack Pullers.

Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.

Nails (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
 Valley Steel Co., St. Louis, Mo.

Nickel Plated Supplies.

Eddy Electric Mfg. Co., Windsor, Conn.

Nickel Platers' Supplies.

Hanson & Van Winkle Co., Newark, N. J.
 Zucker & Levett & Loeb Co., 10 to 14 Grand St., N. Y.

Norway Shapes, Rollers of.

Rowland, William & Harvey, Frankford, Philadelphia.

Novelty Manufacturers.

Ideal Machine Works, Hartford, Conn.

Nut Machines.

Dunham Nut Co., Unionville, Ct.

Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.
 American Iron & Bolt Co., Cincinnati, Ohio.

American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.

Port Chester Bolt & Nut Co., Port Chester, N. Y.

Rhode Island Tool Co., Providence, R. I.
 Russell, Burdall & Ward, Port Chester, N. Y.

Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.

Oil Cups and Lubricators.

Sherwood Mfg. Co., Buffalo, N. Y.

Oilers.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Oilless Anti-Friction Metals.

North American Metalline Co., Long Island City, N. Y.

Oil Cans.

Bloomsburg Mfg. Co., Bloomsburg, Pa.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Ores.

Wister, Francis, Philadelphia, Pa.

Ox Shoes.

Scranton Forging Co., Scranton, Pa.

Packing.

Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.

Padlocks.

Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.

Pails.

Richmond Cedar Wks., Richmond, Va.

Paint.

Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, Ohio.

Paint Cans.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Pants Stretcher.

Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors.

Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.

Pattern Letters.

Wells, Heber, 157 William St., N. Y.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, Philadelphia.

Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.

Halk & Naumann, 516 Pearl, N. Y.

Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.

Vulcan Iron Works, Chicago, Ill.

Pipe, Bent.

National Pipe Bending Co., New Haven, Conn.

Pipe Cutting and Threading Machines.

Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.

Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., Makers of.
 McNab & Harlin Mfg. Co., N. Y.

Pipe, Sewer.

Columbus Sewer Pipe Co., Columbus, Ohio.

Pipe, Water and Gas, Makers of.

Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.

Planers.

Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Pond, L. W. Mch. Co., Worcester, Mass.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plated Ware.

Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.

Plate, Iron and Steel, Mfrs. of.

Etina-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.

Singer, Nimick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Polishing Machines.

Watson & Stillman, 204 E. 43d, N. Y.

Post Hole Diggers.

Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.

Poultry Nettings.

Sarnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

N. J. Wire Cloth Co., Trenton, N. J.
 Tyler Wire Works Co., W. S., Cleveland, Ohio.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.

Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.

Power Hammers.

Dienelt & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Kline & Peck Mfg. Co., New Haven, Conn.
 Scranton & Co., New Haven, Conn.

Power Transmitting Machinery.

Dodge Mfg. Co., Mishawaka, Ind.

Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeport, N. J.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Ct.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Printing and Embossing.

Griffith, Axtell & Cady Co., Holyoke, Mass.

Pruning Shears.

Clyde Cutlery Co., Clyde, O.

Pulleys.

Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Reading Wood Pulley Co., Reading, Pa.
 Reeves Pulley Co., Columbus, Ind.

Pumping Machinery.

Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Collville Steam Pump Co., St. Louis, Mo.
 Lucas, C. O. & Co., Greenville, Ohio.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.

Pump Leathers.

Detroit Valve & Washer Co., Detroit, Mich.

Pumps, Makers of.

Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Myers, F. E. & Bro., Ashland, O.
 Peters Pump Co., Kewanee, Ill.

Punches.

Richards, L. P., Providence, R. I.

Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.
 Butts & Ordway, Boston, Mass.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeport, N. J.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Wais & Roos Punch & Shear Co., Cincinnati, Ohio.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.

Ferry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.

Estey, W. S., 65 Fulton, N. Y.
 Excelsior Cutlery Co., Worcester, Mass.

Razors, Manufacturers of.

Millbury Razor Co., Millbury, Mass.
 Swedish Razor Co., Worcester, Mass.

Reducing Valves.

D'Este & Seelye Co., Boston, Mass.

Reels.

Hendryx, A. B. Co., New Haven, Conn.

Refrigerators.

Wisconsin Refrigerator Co., Eau Claire, Wis.

Rivets.

Blake & Johnson, Waterbury, Conn.
 Burden Iron Co., Troy, N. Y.
 Cobb & Drew, Plymouth, Mass.
 Dover Iron Co. of N. J., Dover, N. J.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.

Riveting Machines.

Att. Jno. & Sons, New Haven, Conn.

Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.

Leechburg Foundry & Mch. Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

Robinson-Rea Mfg. Co., Pittsburgh.

Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

Trethewey Mfg. Co., Pittsburgh, Pa.

Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Rolls, Chilled, Sand and Steel.

Birmingham Iron Foundry, Birmingham, Conn.

Booth, The Lloyd Co., Youngstown, O.

East Chicago Fdy Co., Chicago, Ill.

Garrison, A. Fdy Co., Pittsburgh, Pa.

Robinson-Rea Mfg. Co., Pittsburgh, Pa.

Seaman, Sleigh & Black, Pittsburgh.

Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

Roofing.

Berlin Iron Bridge Co., E. Berlin, Conn.

Cincinnati Corrugating Co., Piqua, O.

N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Rope and Web Goods.

Covert Mfg. Co., West Troy, N. Y.

Covert's Saddlery Wks., Farmer, N. Y.

Rope Wheels.

Cresson, Geo. V. Co., Philadelphia, Pa.

Rubber Goods.

Canfield, H. O., Bridgeport, Conn.

Rules, Manufacturers of.

- Allentown Rolling Mill, Allentown, Pa.**
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Pascale Rolling Mill Co., Paterson, N.J.**
The Phoenix Iron Co., Phila., Pa.
- Pottsville Iron & Steel Co., Pottsville, Pa.**
Roberts, A. & P. & Co., Phila., Pa.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Clausen Shear Co., Fremont, Ohio.
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Pierston & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Goods.**
Bloomsburg Mfg. Co., Bloomsburg, Pa.
- Sheet Zinc.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
- Shoe Stands.**
Kupferle, Jno. C., St. Louis, Mo.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skate Grinding Machinery.**
Perkins, Chas., Bridgewater, Mass.
- Skates, Ice.**
Barney & Berry, Springfield, Mass.
Dane, Stoddard & Kendall, Boston, Mass.
Keene Mfg. Co., Keene, N. H.
Supplee Hardware Co., Phila., Pa.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Union Hardware Co., Torrington, Ct.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Soup Digesters.**
Stuart & Peterson Co., Phila., Pa.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.
- Spelter.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hardley & Graham, 313-315 B'way, N. Y.
- Springes.**
Cold Wire Belting Co., Jersey City, N. J.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Bommer Bros., Brooklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co. 14 Warren St., N. Y.
- Stamping Works.**
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Bristol Co., Waterbury, Conn.
Star Brass Mfg. Co., Boston, Mass.
- Steam Hammers, &c., Makers of.**
Denelt & Eisenhart, Philadelphia, Pa.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Tretbrey Mfg. Co., Pittsburgh, Pa.
Wood, Wm. H., Media, Pa.
- Steam Heating & Oil Separators.**
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**
D'Este & Seelye Co., Boston, Mass.
Lunkenhelmer Co., Cincinnati, O.
- Steam Traps.**
D'Este & Seelye Co., Boston, Mass.
- Steel, Cold Rolled Strip.**
Superior Steel Co., Pittsburgh, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.**
Hoefig, C. W., 52 Fulton St., N. Y.
Ness, Geo. M., Jr., 61 Fulton St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 81 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Musher's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Boker, Hermann & Co., 103 Duane St. Cambria Iron Co., Johnstown, Pa.
Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Frankford Steel Co., Philadelphia.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 81 John, N. Y.
Kaysor, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Landon Iron Co., Salisbury, Conn.
Lukens Iron & Steel Co., Coatesville, Pa.
Moss, F. W., 83 John, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Bowling, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Superior Steel Co., Pittsburgh, Pa.
Valley Steel Co., St. Louis, Mo.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierston & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.**
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Oster Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**
Lincoln Iron Works, Rutland, Vt.
- Store Fixtures.**
Wernicke Co., Minneapolis, Minn.
- Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
Cheney, S. & Son, Manlius, N. Y.
- Stove Trucks.**
Gwinner Mfg. Co., Hamilton, Ohio.
- Street Lamps.**
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Lindsay, Jas. G. & Co., Phila., Pa.
- Structural Tubing.**
National Structural Tubing Co., Potter Bldg., N. Y.
- Sulphuric Acid.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Chess Bros., Pittsburgh, Pa.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Shelton Co., Birmingham, Conn.
- Tack and Nail Machinery.**
Kimball Bros. & Co., Bridgeport, Mass.
Stanley, Geo. W. Co., Belleville, Ill.
Sweetser, W. A., Brockton, Mass.
- Taps and Dies.**
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Sabin Machine Co., Montpelier, Vt.
- Thrust Collars.**
Gouverneur Mach. Co., Gouverneur, N. Y.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngstown, Ohio.
- Tin Plates, Manufacturers of.**
Merchant & Co., Philadelphia, Pa.
- Toe Calks, Steel.**
Burke, F. F., Boston, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tool Holders.**
Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.**
Brown, R. H. & Co., New Haven, Conn.
Leavitt Mch. Co., Orange, Mass.
Logan & Strobridge Iron Co., New Brighton, Pa.
Maynew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stearns, Rule & Level Co., 29 Chambers, Starrett, S. O., Athol, Mass.
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
- Tools, Blacksmith and Wheelwright.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Oster Mfg. Co., Cleveland, Ohio.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters.**
Oster Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
- Tote Boxes.**
Clark, W. J. & Co., Salem, O.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Tree Holders.**
Allentown Hdw. Works, Allentown, Pa.
- Trucks, Manufacturers of.**
Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**
Ansonia, Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Avery Stamping Co., Cleveland, O.
Lewy's, John S. Son & Co., 4 Fletcher St., New York.
Sheiby Steel Tube Co., Shelby, Ohio.
U. S. Projectile Co., Brooklyn, N. Y.
- Tubing, Structural.**
National Structural Tubing Co., Potter Bldg., N. Y.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
McGee Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenhelmer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John, N. Y.
- Ventilating Fans.**
Huyett & Smith Mfg. Co., Detroit, Mich.
Perkins, B. F. & Son, Holyoke, Mass.
- Ventilator Appliances.**
Howard & Morse, 15 Fulton St., N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Lewis Tool Co., 44 Barclay, N. Y.
Logan & Strobridge Iron Co., New Brighton, Pa.
Millers Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
- Wagon Jacks.**
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
Richmond Cedar Wks., Richmond, Va.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Bryan Mfg. Co., Bryan, Ohio.
Sidney Steel Scraper Co., Sidney, O.
Thomas, G. W. & Co., Toledo, O.
Withington & Cooley Mfg. Co., Jackson, Mich.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Baackes & Co., Pittsburgh, Pa.
Cincinnati Barb Wire Fence Co., Cincinnati, O.
Miller & Van Winkle, Brooklyn, N. Y.
Murray, Austin & Co., Philadelphia, Pa.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Stewart Wire Co., Easton, Pa.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
East, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y.
Howard & Morse, 45 Fulton, N. Y.
Ludlow-Saylor Wire Co., St. Louis, Mo.
N. J. Wire Cloth Co., Trenton, N. J.
New York Wire Cloth Co., 102 Chambers St., N. Y.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.**
Higginson Hdw. Co., Higginson, Conn.
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.
- Wire Dowels.**
Bond Nail Co., Raynham, Mass.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
Am. Wire Goods Co., Lowell, Mass.
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Meyers, Fred J. Mfg. Co., Hamilton, O.
New York Wire Cloth Co., 102 Chambers St., N. Y.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T., Wire Novelty Co., Newark, N. J.
Wire Goods Co., Worcester, Mass.
- Wire Hangers.**
Barber-Koenig Mfg. Co., Hazleton, Pa.
- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
Cross & Speirs Mch. Co., Waterbury, Conn.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.
- Wire Nails.**
Baackes & Co., Pittsburgh, Pa.
California Wire Works, San Francisco, Cal.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass.
Whitney, A. R. & Co., New York City.
- Wire Rods, Steel.**
Baackes & Co., Pittsburgh, Pa.
New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.**
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
- Wire Rope Machinery.**
Ray, J. F., Passaic, N. J.
- Wire Straightening and Cutting Machinery.**
Adt, John & Son, New Haven, Conn.
- Wood Turning.**
Cleveland Wood Turning Co., Cleveland, O.
- Wood-Working Machinery.**
Fay, J. A. & Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Wrenches, Manufacturers**
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coes Wrench Co., Worcester, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
Trimont Mfg. Co., Roxbury, Mass.
Walworth Mfg. Co., Boston, Mass.
- Wringers.**
Colby Winger Co., Montpelier.
National Winger Co., Canton, O.
- Yacht Hardware.**
Ferdinand, L. W., & Co., Boston, Mass.

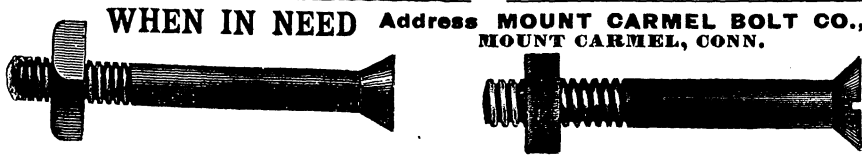
ALPHABETICAL INDEX TO ADVERTISERS.

Abbott, Wheelock & Co.	18	Britton, J. Blodgett	28	Cramp, Wm. & Sons S. & E. B. Co.	3	Gould & Eberhardt	36
Acme Shear Co.	73	Broderick & Bascom Rope Co.	6	Cramp Metal Mfg. Co.	3	Goulds Mfg. Co.	36
Adams & Westlake Co.	87	Bronson Supply Co.	70	Crawford Mfg. Co.	82	Gouverneur Machine Co.	50
Adt, John & Son	41	Brown, A. & F.	50	Crescent Horse Shoe & Iron Co.	99	Grafton Stone Co.	51
Atlas-Standard Iron & Steel Co.	20	Brown, E. E. & Co.	90	Crescent Mfg. Co.	8	Graham, John H. & Co.	85
Aiken, Henry	26	Brown Hoisting & Conveying Mch. Co.	36	Crescent Phosphorized Metal Co.	3	Grand Crossing Tack Co.	13
Alexander Bros.	37	Brown, R. H. & Co.	64	Crescent Steel Co.	20	Grand Rapids Cycle Co.	82
Allentown Hdw. Wks.	25&68	Bryan Mfg. Co.	102	Cresson, Geo. V. Co.	50	Grand Rapids Hand Screw Co.	74
Allentown Rolling Mills	22	Bryden Horse Shoe Co.	97	Croissant, M. Co.	90	Green, A. H.	79
Allis, E. P. Co.	28	Suck Bros.	73	Crosby, G. A. & Co.	89	Griffith, Axtell & Cady Co.	72
American Bolt Co.	105	Buck, Chas.	73	Cross & Speirs Mch. Co.	53	Gwinner Mfg. Co.	64
American Iron & Bolt Co.	13	Buckeye Churn Co.	87	Crown Smelting Co.	3	Haight & Clark	25
American Metal Co.	8	Buckeye Mfg. Co.	26	Cunliffe, R. M.	58	Halk & Naumann	8
American Pig Iron Storage Warrant Co.	19	Buffalo Forge Co.	114	Cushman Chuck Co.	45	Halsey, Jas. T.	89
American Screw Co.	14	Buffalo Scale Co.	95	Cutter, Wood & Stevens	51	Hamilton Machine Tool Co.	41
American Specialty Co.	73	Buhl Stamping Co.	79	Dallett, Thos. H. & Co.	47	Hammer & Co.	95
American Tool Co.	72	Bu'ard Mch. Tool Co.	54	Dame, Stoddard & Kendall	80	Hanson & Van Winkle Co.	31
American Tool Works	56	Burden Iron Co.	97	D'Amour & Littledale	44	Hardware Board of Trade	61
American Wire Goods Co.	113	Burke, P. F.	99	Dangler Stove & Mfg. Co.	85	Harrington, E., Son & Co.	40
Ames Sword Co.	93	Burr & Houston Co.	23	Darby, Edw. & Sons	8	Harrington & King Perforating Co.	9
Amidon Tool Corporation	72	Butler, C. N.	6	Davis, I. B. & Son	31	Harrington & Richardson Arms Co.	85
Anderson, F. S. & Co.	104	Butler Mfg. Co.	66	Davis, W. P.	55	Harris, Wm. A. Steam Engine Co.	34
Ansonia Brass & Copper Co.	2	Butterfield & Co.	45	Davol, John & Sons	2	Harrison Safety Boiler Wks.	29
Arcade File Works	70	Butts & Ordway	39	Dean Bros. Steam Pump Works	35	Hart Mfg. Co.	45
Arcade Malleable Iron Co.	27	Butze, Adolph	58	Delts, A. E.	93	Hartford Machine Screw Co.	53
Armstrong Bros. Tool Co.	47	Byers, Jno. F. Mch. Co.	58	Deming Co.	60	Hartford Steam Boiler Insp. and Ins. Co.	30
Armstrong Mfg. Co.	46	Byram & Co.	28	Demorest Mfg. Co.	82	Hartley & Graham	1
Atthol Machine Co.	76	C. & C. Electric Co.	30	D'Este & Seeley Co.	31	Haskell, Wm. H. Co.	108
Atkins, E. C. & Co.	98	Caldwell Mfg. Co.	93	Detrick & Harvey Machine Co.	49	Hazard Mfg. Co.	6
Atlas Mfg. Co.	114	California Wire Works	6	Diamond Machine Co.	51	Heinisch's R. Sons Co.	73
Atlas Tack Corporation	13	Cambria Iron Co.	16	Dienelt & Eisenhardt	42	Henderson Bros.	23
Avery Stamping Co.	75	Cambridge Iron & Steel Co.	15	Dietz, Schumacher & Co.	43	Hendey Machine Co.	63
Ayer, H. C. & Gleason Co.	88	Canfield, H. O.	37	Dille & McGuire Mfg. Co.	104	Hendricks Bros.	3
Baackes & Co.	5	Canton Saw Co.	67	Diston, Henry & Sons	69	Hendrick Mfg. Co., Ltd.	7
Babcock & Wilcox Co.	34	Capewell Horse Nail Co.	98	Dixon, Jos., Crucible Co.	37	Hendryx, A. B. Co.	3
Baeder, Adamson & Co.	64	Carbon Steel Co.	20	Dodd, A. W. & Co.	1	Henley, M. C.	85&103
Banker & White	71	Carl's Sons, Thomas	55	Dodge Mfg. Co.	50	Herrick, J. A.	27
Barber-Koenig Mfg. Co.	79	Carpenter, J. M. Tap & Die Co.	113	Donaldson Iron Co.	23	Herrick & Cowell	44
Bardsley, J.	62	Cary Mfg. Co.	76	Douglas, W. & B.	66	Hertz, T. & Son	3
Barney & Berry	80	Chadborne & Coldwell Mfg. Co.	103	Dover Fire Brick Co.	61	Higginum Hdw. Co.	86
Barns, C. K. & Co.	22	Chambers Bros. Co.	106	Dover Iron Co. of N. J.	22	Hill, Clarke & Co.	57
Barnes, W. F. & John	39	Champion Blower & Forge Co.	44	Draper Machine Tool Co.	55	Hill, N. N. Brass Co.	88
Barnett, G. & H.	71	Chandler & Taylor Co.	7	Dudgeon, Richard	43	Hobson, F., Seaman & Co.	13
Barnum, E. T.	9	Chapman Valve Mfg. Co.	31	Dunbar Bros.	4	Hoeft, C. W.	65
Bass Foundry & Machine Works	29	Chatillon, John & Sons	79	Dunham Nut Co.	105	Hoffman, J. W. & Co.	17
Bay State Stamping Co.	52	Cheney, S. & Son	23	Durant, W. N.	38	Hogan, John L. & Co.	17
Beaman & Smith	54	Chess Bros.	23	Dwight Slate Machine Co.	43	Hoggson & Pettis Mfg. Co.	44
Bement, Miles & Co.	42	Chester Steel Casting Co.	23	Eagle Anvil Works	70	Hollands Mfg. Co.	67
Bemis & Call Hardware & Tool Co.	95	Chicago Spring Butt Co.	87	Eagle Bicycle Mfg. Co.	113	Holmes & Edwards Silver Co.	74
Berger Bros.	98	Chrome Steel Works	19	East Chicago Foundry Co.	23	Hooker-Colville Steam Pump Co.	35
Berlin Iron Bridge Co.	11	Church, Isaac	103	Eccles, Richard	94	Houston, C. B. & Co.	17
Bethlehem Iron Co.	22	Cincinnati Barb Wire Fence Co.	12	Eddy Electric Mfg. Co.	31	Howard Iron Works	71
Bevin Bros. Mfg. Co.	82	Cincinnati Corrugating Co.	9	Enterprise Mfg. Co. of Pa.	89	Howard & Morse	7
Bickford Drill & Tool Co.	41	Claffen Mfg. Co.	37	Estey, W. S.	6	Howson & Howson	6
Bicycle Step Ladder Co.	39	Clapp, E. D. Mfg. Co.	99	Etting, Edw. J.	17	Hubbell, Harvey	106
Bigelow, C. R.	56	Clapp, Geo. M.	56	Excelsior Needle Co.	114	Hulbert Bros. & Co.	68
Biggall & Keeler Mfg. Co.	42	Clark, G. P.	102	Eynon-Evans Mfg. Co.	28	Hutchinson, F. S. Co.	72
Billings & Spencer Co.	95	Clark, W. J. & Co.	51	F. & N. Mfg. Co.	104	Huyett & Smith Mfg. Co.	41
Bingham, W. Co.	82	Clark Mfg. Co.	92	Fairmount Machine Co.	49	Ideal Machine Works	54
Birmingham Iron Foundry	28	Clauss Shear Co.	75	Fay, J. A. & Co.	44	Ideal Mfg. Co.	82
Bissell, E. Son & Co.	58	Clement & Dunbar	67	Fearing, Wm. S.	2	Independent Electric Co.	82
Blair Mfg. Co.	108	Clendenin Bros.	13	Ferdinand L. W. & Co.	85	Indiana Wire Fence Co.	7
Blake & Johnson	12	Cleveland Block Co.	93	Ferracute Machine Co.	40	Iowa Farming Tool Co.	101
Bliss Co., E. W.	38	Cleveland City Forge & Iron Co.	1	Fischer Fdry. & Mch. Co.	29	Jacobus, W. H.	103
Bloomsburg Mfg. Co.	4	Cleveland Rubber Works	8	Fitch, W. & E. T.	113	Jarecki Mfg. Co.	44
Blount Mfg. Co.	91	Cleveland Stamping & Tool Co.	88	Fitchburg Machine Works	36	Jeffrey Mfg. Co.	36
Boardman, L. & Son	73	Cleveland Stone Co.	52	Flagg, Stanley G. & Co.	114	Jenkins Bros.	1
Boker, Hermann & Co.	18	Cleveland Twist Drill Co.	47	Folding Paper Box Co.	72	Jenkins & Lingle	39
Bommer Bros.	114	Cleveland Wood Turning Co.	90	Foss Mfg. Co.	99	Jenner, H. W. T.	6
Bond Nail Co.	12	Clinton Wire Cloth Co.	8	Fralm, E. T.	93	Jersey City Galvanizing Co.	15
Boone, W. C. Mfg. Co.	23	Clyde Cutlery Co.	76	Frankford Steel Co.	19	Jessop, Wm. & Sons	18
Booth, The Lloyd Co.	28	Cobb & Drew	6	Fulton Iron & Engine Works	48	Johnson, I. H., Jr., & Co.	48
Borden & Lovell	10	Coburn Trolley Track Mfg. Co.	9	Gardner, Jas. & Son	28	Jones, B. M. & Co.	20
Borgner, Cyrus	24	Coes, Loring & Co.	100	Garland Chain Co.	16	Jones, Jesse & Co.	71
Boston Casting Co.	3	Coes Wrench Co.	100	Garrison, A., Foundry Co.	22	Jones & Lamson Machine Co.	62
Boston Gear Works	29	Coffin & Leighton	35	Garry Iron & Steel Rfg. Co.	12	Kay, J. F.	4
Box, Alfred & Co.	48	Colby Wringer Co.	87	Gartland Foundry Co.	25	Kayser, Ellison & Co.	18
Bradlee & Co.	10	Coldwell Lawn Mower Co.	103	Gaylord, F. L. Co.	3	Keating Wheel Co.	63
Brass Goods Mfg. Co.	2	Coleman, J. A.	58	Geneva Cycle Co.	83	Keeley, Jerome & Co.	17
Bridgeport Deoxidized Bronze & Metal Co.	2	Collins, H. E. & Co.	34	Gibbs Mfg. Co.	102	Keene Mfg. Co.	80
Bridgeport Gun Implement Co.	70	Columbus Sewer Pipe Co.	63	Gilbert & Bennett Mfg. Co.	8	Kennedy, Julian	26
Briggs, Marvin	56	Continental Iron Works	23	Gillette Clipping Machine Co.	74	Keys, W. W. & R. M. Co.	3
Bristol Co.	1	Corning, Edw. & Co.	18	Goddard, Asa	42	Keystone Clutch & Machine Works	48
		Correspondence School of Mechanics	63	Goodell Co.	75	Kilmer Mfg. Co.	7
		Cotton, Barclay W. & Co.	22	Goodell, J. W. Co.	72	Kimball Bros. & Co.	10
		Covert Mfg. Co.	94			King, J. M. & Co.	71
		Covert's Saddlery Works	63			Kings County Iron Foundry	100
		Cox, Justice Jr.	17			Kohler, F. B. & Co.	104

Kraischer, B. & Sons.....	28	New Haven Wire Mfg. Co.....	6	Rogers, The Wm. Mfg. Co.....	74	Thomas, G. W. & Co.....	102
Kupferle, Jno. C.....	61	N. J. Wire Cloth Co.....	8	Rome Brass & Copper Co.....	2	Thomson, W. H. & Co.....	17
La Belle Steel Co.....	21	New Process Twist Drill Co.....	47	Rowland, Wm. & Harvey.....	114	Tiebout, W. & J.....	92
Lafin & Rand Powder Co.....	23	Newton & Shipman.....	18	Russell, Burdall & Ward.....	114	Titchener, E. H. & Co.....	9
Landon Iron Co.....	18	N. Y. Belting & Packing Co.....	37	Russia Cement Co.....	85	Tod, Wm. & Co.....	29
Lane Brothers.....	93	N. Y. Powder Co.....	23	Sabin Machine Co.....	4	Toomey, Frank.....	56
Lane & Bodley Co.....	30	N. Y. Iron Roofing & Corrugating Co.	2	Salem Wire Nail Co.....	12	Torrance Iron Co.....	25
Laughlin, Alex. & Co.....	26	N. Y. Stamping Co.....	87	Samson Cordage Works.....	1	Totten & Hogg Iron and Steel Fdry.	
Lay, Jos. & Co.....	91	N. Y. Wire Cloth Co.....	9	Samuel, Frank.....	16	Co.....	23 & 34
Lea, J. Tatnall & Co.....	27	Nicholson File Co.....	71	Saunders' Sons, D.....	43	Tower & Lyon.....	78
Lean, D. R. Co.....	22	Nicolls, Wheeler & Co.....	22	Sawyer Hdw. & Supply Co.....	41	Townsend, W. P. & Co.....	106
League Cycle Co.....	113	Niles Tool Works.....	37	Scattergood, H. W.....	54	Trenton Iron Co.....	4
Leavitt Machine Co.....	91	North Bros. Mfg. Co.....	19 & 63	Scheeler & Sons.....	10	Trethewey Mfg. Co.....	26
Le Count, C. W.....	99	North American Metalline Co.....	3	Schneider & Trenkamp Co.....	36	Trimont Mfg. Co.....	95
Leechburg Foundry & Machine Co.....	23	Northampton Cutlery Co.....	75	Scott, Geo. M.....	44	Tyler Wire Works Co. W. S.....	62
Leng's, Jno. S. Son & Co.....	114	Northampton Emery Wheel Co.....	62	Scoville Mfg. Co.....	2	Union Hardware Co.....	78
Leonard, B. E.....	89	Norton Bros.....	92	Scranton & Co.....	39	Union Lock & Hdw. Co.....	92
Leonard, J.....	28	Norton Emery Wheel Co.....	52	Scranton Forging Co.....	97	Union Mfg. Co.....	46
Leschen, A. & Sons Rope Co.....	6	Norwalk Iron Works Co.....	35	Scranton Supply & Machine Co.....	55	Union Metallic Cartridge Co.....	1
Levis, Henry & Co.....	22	Oakes & Irwin.....	100	Seaman, Sleeth & Black.....	23	Union Show Case Co.....	72
Lewis Tool Co.....	67	Obermayer, S. Co.....	22	Sebastian Lathe Co.....	48	U. S. Projectile Co.....	43
Lidgerwood Mfg. Co.....	114	Ogden & Wallace.....	21	Sellers, Wm. & Co.....	49	Valentine, M. D. & Bro. Co.....	28
Lincoln Iron Works.....	46	Old Dominion Iron & Nail Works Co.	97	Seneca Falls Mfg. Co.....	48 & 68	Valley Pump Co.....	35
Lindsay, Jas. G. & Co.....	17	Oster Mfg. Co.....	46	Sessions Foundry Co.....	24	Valley Steel Co.....	1
Link-Belt Engineering Co.....	39	Ostrander Fire Brick Co.....	28	Seyfert's Sons, L. F.....	55	Van Dorn Iron Works Co.....	7
Lockhart Iron & Steel Co.....	18	Ostrander, W. R. & Co.....	94	Shelby Steel Tube Co.....	27	Van Wagoner & Williams Hdw. Co.....	114
Logan & Strobbridge Iron Co.....	66	Otto Gas Engine Works.....	33	Shelton Co.....	13	Vineland Forge Works.....	26
Lovell, Jno. P. Arms Co.....	114	Palmer, I. E.....	84	Sherwood Mfg. Co.....	30	Vulcan Iron Works.....	28
Loyd, John.....	76	Palmer & De Mooy Fdry. Co.....	24	Shickle, Harrison & Howard Iron Co.	24	Wals & Roos Punch & Shear Co.....	39
Lucas, C. O. & Co.....	30	Palmer Hardware Mfg. Co.....	94	Shoenberger & Co.....	96	Walker Mfg. Co.....	25
Ludlow-Saylor Wire Co.....	7	Pancoast, Henry B. & Co.....	44	Shultz Belting Co.....	1	Wallace Wm. H. & Co.....	16
Lufkin Rule Co.....	67	Parker, Chas. Co.....	89	Sickels, Sweet & Lyon.....	79	Walworth Mfg. Co.....	113
Lukens Iron & Steel Co.....	16	Parsons, R. E. Co.....	25	Sidney Steel Scraper Co.....	102	Wardlow, S. & C.....	18
Lundberg, Gustaf.....	19	Passaic Rolling Mill Co.....	20	Sigourney Tool Co.....	41	Warner Elevator Mfg. Co.....	49
Lunkenheimer Co.....	32	Peck, A. G. & Co.....	114	"Silver Finish".....	76	Washburn & Moen Mfg. Co.....	4
McCabe, J. J.....	75	Penn Elevator Engineering Co.....	49	Silver Mfg. Co.....	95	Waterbury Brass Co.....	2
McCaffrey File Co.....	71	Pennsylvania Bolt & Nut Co.....	105	Simonds Mfg. Co.....	68	Waterbury Farrel Foundry & Ma-	
McCallip Fence & Wire Works.....	10	Pennsylvania Mch. Co.....	55	Singer, Nimick & Co.....	21	chine Co.....	45
McClure & Amster.....	27	Perkins, B. F. & Son.....	40	Skinner Chuck Co.....	46	Waterbury Machine Co.....	45
McCoy, Jos. F. Co.....	46	Perkins, Chas.....	76	Smith & Egge Mfg. Co.....	31	Watson & Stillman.....	43
McFarland, Wm.....	4	Perry, W. H. & Co.....	57	Smith, H. D. & Co.....	99	Webster, Warren & Co.....	32
McGowan, J. H. & Co.....	35	Peters Pump Co.....	67	Smith, J. D. Foundry Supply Co.....	24	Wells Bros. & Co.....	46
McIlvain, Wm. & Sons.....	17	Philadelphia Engineering Wks.....	26	Smith, Theo. V.....	72	Wells, Heber.....	54
McKay, Jas. & Co.....	16	Phila Machine Screw Works.....	13	Smythe, S. R. Co., Inc.....	26	Wernicke Co.....	89
McKinney Mfg. Co.....	92	Phoenix Horseshoe Co.....	27	Snyder, J. L.....	79	Westwick, J. & Son.....	26
McKinnon Dash & Hdw. Co., Ltd.....	97	Phoenix Iron Co.....	26	Sommer's Son, John.....	114	Wetherell Bros.....	18 & 21
McLean, John.....	29	Phosphor Bronze Smelting Co.....	3	Southwark Foundry & Machine Co.....	32	Wetherhill, Robt. & Co.....	113
McNab & Harlin Mfg. Co.....	29	Pierce, Geo. N. & Co.....	84	South, W. A. Co.....	65	White, A. A. & Co.....	71
Machinists' Supply Co.....	56	Pierson & Co.....	72	Souther, E. E. Iron Co.....	95	White, L. & I. J. Co.....	73
Mahoning Valley Iron Co.....	19	Pike Mfg. Co.....	19	Speldel & Roeper.....	49	White Mt. Freezer Co.....	63
Main Belting Co.....	37	Pilling & Crane.....	17	Spencer's I. S. Sons.....	24	White, Van Glahn & Co.....	72
Manning, Maxwell & Moore.....	47	Pittsburgh Mfg. Co.....	37	Springfield Gas Engine Co.....	34	Whiting Foundry Equipment Co.....	27
Manville Machine Co., E. J.....	74	Pittsburgh Reduction Co.....	62	Standard Fdry. & Mfg. Co.....	24	Whitlock Coil Pipe Co.....	83
Maris & Beekley.....	49	Place, Geo.....	55	Standard Horse Shoe Co.....	97	Whitney, A. R. & Co.....	19
Marlin, J. & Son.....	35	Pleuger & Henger Mfg. Co.....	103	Standard Tool Co.....	47	Whitton, D. E. Mch. Co.....	45
Mathlessen & Hegeler Zinc Co.....	2	Plumb, Fayette R.....	75	Stanley, Geo. W. Co.....	13	Wickwire Bros.....	7
Maurer, H. & Son.....	28	Plume & Atwood Mfg. Co.....	2	Stanley Rule & Level Co.....	113	Wilcox, Crittenden & Co.....	25
Mayhew, H. H. Co.....	70	Pollock, W. B. & Co.....	29	Stanley Works.....	92	Wilcox & Howe Co.....	99
Merchant & Co.....	10	Pond, L. W. Moh. Co.....	42	Star Brass Mfg. Co.....	113	Willey & Russell Mfg. Co.....	40 & 114
Merrill Bros.....	2	Pope, Robt. & Son Co.....	34	Starrett, L. S. Co.....	67	Williamson, C. T. Wire Nov. Co.....	82
Merrill Mfg. Co.....	48	Port Chester Bolt & Nut Co.....	105	Steam Gauge & Lantern Co.....	79	Wilmot & Hobbs Mfg. Co.....	1
Meyers, Fred J. Mfg. Co.....	88	Porter, E. N. & Co.....	86	Stearns, E. C. & Co.....	62	Wilson, E. H. & Co.....	22
Miles, F. S.....	12	Porter, H. K.....	105	Stelle, Chas. C.....	86	Wilson, John.....	72
Millbury Razor Co.....	73	Pottstown Iron Co.....	19	Stephens & Co.....	113	Wilson, J. Fred.....	108
Miller & Van Winkle.....	114	Pottville Iron & Steel Co.....	16	Stephens & Co.....	55	Wilson, W. A.....	42
Millers Falls Co.....	64 & 114	Powell Planer Co.....	40	Sterling Cycle Works.....	82	Wilson, Sam'l, Skate Mfg. Co.....	81
Milne, A. & Co.....	19	Pratt & Cady Co.....	113	Sterling Emery Wheel Co.....	52	Winstow, Wm. & Co.....	83
Milton Mfg. Co.....	105	Prentiss Tool & Supply Co.....	55	Sternbergh, J. H. & Son.....	106	Winton Bicycle Co.....	81
Miner & Peck Mfg. Co.....	42	Prentiss Vise Co.....	66	Stevens, J. Arms & Tool Co.....	70	Wire Goods Co.....	10
Mohr, J. J.....	17	Pullman Sash Balance Co.....	73	Steward & Romaine Mfg. Co., Ltd.....	105	Wisconsin Refrigerator Co.....	88
Monce, S. G.....	64	Putnam Nail Co.....	98	Stewart Wire Co.....	6	Wister, Francis.....	17
Montour Iron & Steel Co.....	22	Q. & C. Co.....	41	Stiles & Parker Press Co.....	38	Wister, L. & R. & Co.....	22
Moore, Dr. Gideon E.....	2	Quint, A. D.....	43	Stirling Co.....	33	Withington & Cooley Mfg. Co.....	101
Moore Mfg. & Foundry Co.....	49	Rainey, W. J.....	1	Stocking, E. B.....	6	Wolf, W. & L.....	93
Moore & White Co.....	50	Randolph & Clowes.....	1	Storm Mfg. Co.....	66	Wolf, R. H. & Co. Ltd.....	5
Morford Register Co.....	65	Reading Hardware Co.....	94	Stover Mfg. Co.....	82	Wollensak, J. F.....	94
Morgan Construction Co.....	4	Reading Wood Pulley Co.....	50	Stow Flexible Shaft Co.....	47	Wood Alan & Co.....	17
Morgan Spring Co.....	4	Read, Wm. & Sons.....	128	Stow Mfg. Co.....	47	Wood, R. D. & Co.....	24
Morrison, Robert.....	35	Reeves, Paul S.....	114	Streeter, N. R. & Co.....	90	Wood, W. Dewees Co.....	21
Morse Twist Drill & Machine Co.....	47	Reeves Pulley Co.....	52	Stuart & Peterson Co.....	94	Wood, Wm. H.....	40
Morse, Williams & Co.....	49	Republic Press.....	34	Sturtevant, B. F. Co.....	42	Woodward & Rogers.....	40
Morton, Thos.....	95	Reynolds & Co.....	12	Sumner, H. W.....	30	Worcester Mch. Screw Co.....	106
Moseley Iron Bridge & Roof Co.....	9	R.I. Perkins Horse Shoe Co.....	97	Superior Steel Co.....	5	Worthington, Henry R.....	35
Mount Carmel Bolt Co.....	118	Rhode Island Tool Co.....	1	Supplier Hardware Co.....	103	Wright & Colton Wire Cloth Co.....	8
Murray, Austin & Co.....	52	Rhodes, L. E. Co.....	54	Swedish Razor Co.....	76	Wrightville Hardware Co.....	63
Myers, F. E. & Bro.....	66	Rice Mfg. Co.....	27	Sweetser, W. A.....	13	Wurster, F. W. & Co.....	114
National Horse Nail Co.....	99	Richardson, C. F. & Son.....	67	Swindell, W. & Bros.....	26	Wyman & Gordon.....	95
National Pipe Bending Co.....	33	Richards, I. P.....	113	Syracuse Smelting Works.....	61	Yale & Towne Mfg. Co.....	48 & 65
National Saw Co.....	68	Richmond Cedar Works.....	90	Tablet & Ticket Co.....	54	Zucker & Levett & Loeb Co.....	31
National Structural Tubing Co.....	15	Ridgway, Craig & Son.....	48	Talbot Mfg. Co.....	67		
National Wringer Co.....	92	Rishle Bros. Testing Machine Co.....	86	Talcott, W. O.....	36		
Ness, Geo. M., Jr.....	65	Riverside Iron Works.....	20	Tanite Co.....	114		
Newark Machine Tool Works.....	62	Roberts, A. & P. & Co.....	19	Taunton Locomotive Mfg. Co.....	33		
New Castle Wire Nail Co.....	12	Roberts Mfg. Co.....	36	Taunton Wire Nail Co.....	13		
New Haven Copper Co.....	2	Robinson-Rea Mfg. Co.....	22	Taylor Battery Co.....	61		
New Haven Mfg. Co.....	42						


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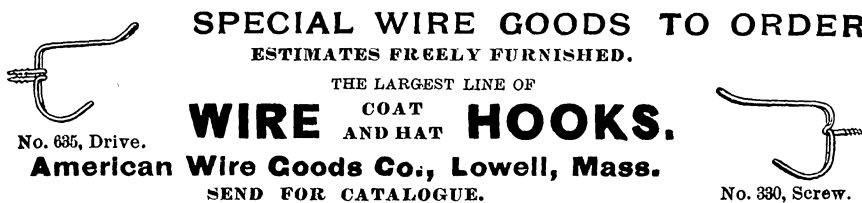
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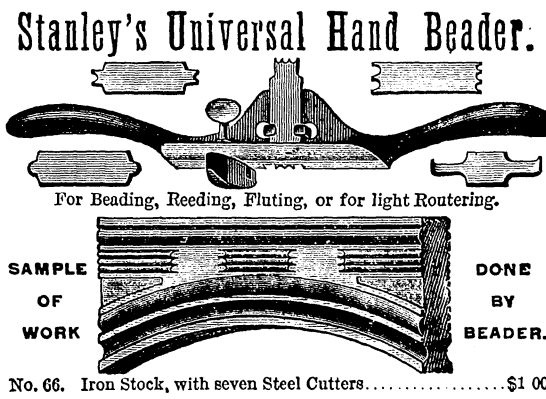
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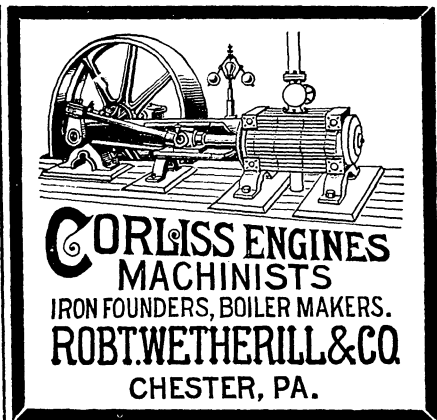


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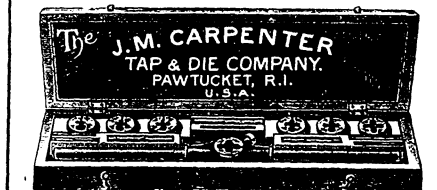
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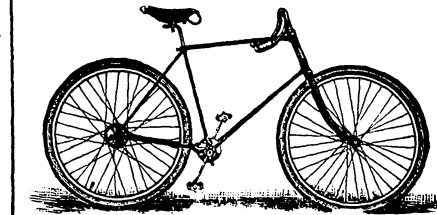
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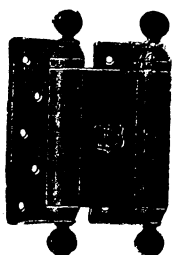
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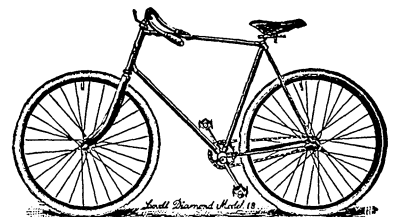
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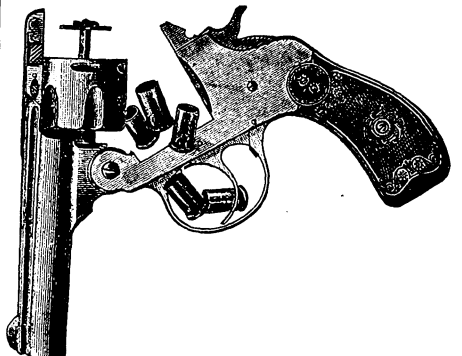
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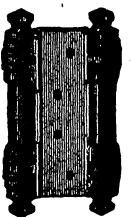
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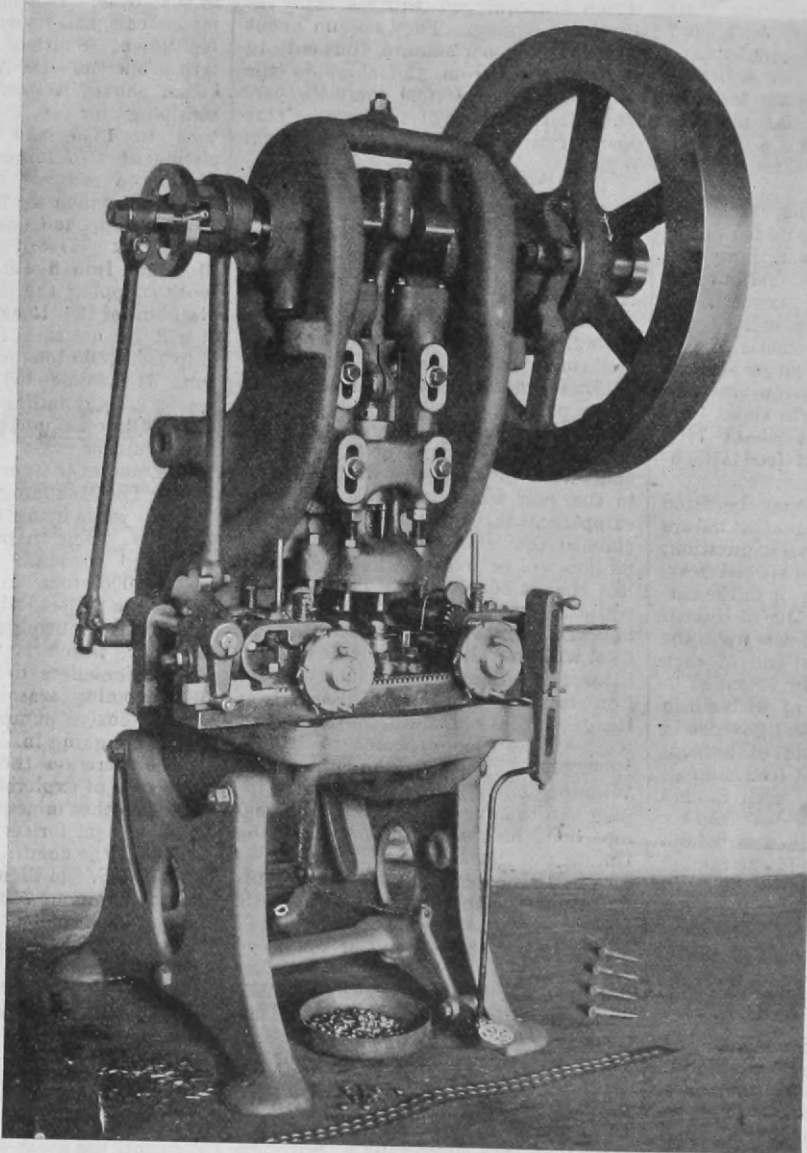
The Ferracute Double Action Drawing Press.

The Ferracute Machine Company of Bridgeton, N. J., recently built for the United States Arsenal at Frankford, Pa., a double action drawing press fitted with double feed rolls, scrap clipper, gang dies for cutting and drawing cartridge cups, &c.

Considering it first without the attachments the press proper is one of a

plunger, when up, 17 inches; stroke of plunger, 5 inches; adjustment of plunger, 3 inches; fly wheel, 42 x 6 inches, and weight of same 1150 pounds; speed of fly wheel, 80 revolutions per minute; thickness of bolster, 3 inches, and round hole in same 7½ inches; pressure safely exerted by ram, 52 tons; maximum diameter of work, 7 inches, and depth 2 inches; maximum blank diameter, 11 inches. This machine is built with a frame so mounted upon its legs as to be quickly inclinable to any de-

hole for shanks of punches, with a locking arrangement which moves them positively up and down, but allows sufficient play so they may enter their dies accurately and centrally, while at the same time leaving room to put in bushings to fit various odd punches which may be required. The bolster is provided with a deep and heavy truss extending down into the bed of the press so that it may remain perfectly flat and yet can be tipped slightly out of level at its different corners by four sliding



THE FERRACUTE DOUBLE ACTION DRAWING PRESS.

series of five sizes belonging to what the makers call their "class D" drawing presses. Being of the fourth size it is known as "press D4." As shown it is driven by a fly wheel direct, but when the same press is arranged for back gearing it is then known as "press DG4," G being the gearing symbol for all presses of this make. Its dimensions are as follows: Round hole through bed, 10 inches; throat, from ram center back to frame, 9 inches; height, bed to ram, with ram up, 12 inches; stroke of ram, 2½ inches; adjustment of ditto, 3 inches; height, bed to

sired angle by a convenient geared elevating screw and proper clamping nuts for securing the same.

The spring ram lifter is arranged with an equalizing lever so that the lifting is practically equal all the way up, together with a positive lifting device connected with the pitman so that the cams cannot leave the rollers in case the spring lifter should fail. The ram has a very large hole for deep punches to pass into, and yet has solid metal whereto upper dies may be fastened by the hooked clamps provided, together with a plunger having a large and long

wedges driven by screws and nuts, while at the same time its thin and elastic edges are firmly clamped to the bed, thus enabling dies to be accurately aligned to each other to prevent wrinkling of work. A pair of stay rods are furnished which can be quickly inserted in the frame, thus making the press nearly as stiff as a straight column press upon certain occasions where great rigidity is required, and where it is not necessary to pass long sheets through sidewise, as is usually done in "throated" presses. The shaft is of forged steel with large and long jour-

nals. In an enlargement of its solid metal is mounted an automatic stop clutch of extreme simplicity, and which has its different members so interlocked with each other in the process of assembling as to require no nuts or screws whatever—these being objectionable in a device of this kind where the tendency is constantly to knock them loose. This clutch is provided with a safety lock which can be so manipulated as to prevent the press from starting while dies are being set, &c. A new feature consists in a so-called "brake plate," carrying the tripping device, which is adjustable around the shaft's axis, thus allowing the clutch to be tripped either earlier or later than the normal, to accommodate itself to varying degrees of momentum dependent upon the conditions of speed, lubrication, extra weights upon the shaft (as cams, gears, pulleys, &c.), and other circumstances which usually have to be controlled entirely by a brake, thus in many cases losing a large amount of power. To the plate in question is attached an adjustable brake, which, however, is usually set with but slight pressure.

In general, this machine is characterized by carefully proportioned parts, great weight and inertia in those submitted to heavy stresses, harmonious curves, heavily rounded corners, absence of external ribs, case hardened bolts and nuts of large diameter, &c.

Three smaller and one larger sizes of presses of this same design are also built. The smallest weighs about 1200 pounds, and the largest about 7400 pounds, reckoned without feed attachments, &c.

Any of these presses may be fitted with attachments of the general nature shown in the cut. The one in question, however, possesses certain special features of interest adapting it to the cartridge work referred to. One of these is a set of six differential pawls upon the disk shown at the front end of each lower feed roll. These are arranged to act upon a ratchet wheel of 61 teeth in such a way that each pawl governs in succession the stopping point of the feed, thus enabling variations of feed as small as $\frac{1}{16}$ inch by reason of each ratchet tooth being virtually divided into six parts, so to speak—a fineness which could not be incorporated in the ratchet itself, as such teeth would be too small for strength and durability. Were the ratchet to have 60 teeth it is evident that all the pawls would engage simultaneously. By adding one tooth, however, to 60, the differential effect above mentioned is obtained.

In this double roll feed attachment is shown the rack and pinion connection generally used in presses of this make, this being, it is claimed, an improvement upon the old system of a pitman attached to levers, inasmuch as it allows any desired angular motion of the rolls, even more than one whole turn if necessary, thus giving a considerable length of feed. By the old system not more than about one-third of a revolution can be obtained, which, where long feeds are desired, necessitates an inconveniently large diameter of roll. This rack system also permits the feed rolls, with their housings, to be adjusted bodily right and left, either nearer to or further from each other, to suit that size of the dies which must be placed between them.

The length of feed required is obtained by adjusting the crank pin in its disk as usual, this being done at the extreme left end of the main shaft. Just to the right of the crank disk is shown

another pitman driven by an eccentric which works a small shears for clipping the scrap into short pieces as it comes from the rolls, thus making it very convenient to handle.

At the right of the press bed is shown an attachment for automatically releasing the treadle of the press from its locked down position when the strip of metal comes to an end. This is accomplished by a light, bent lever (shown extending above the right hand rolls) which rests upon the metal, but falls by its own weight when the same is not present. It thus releases a delicate catch which allows the weighted bar to drop, with the result of unlocking the treadle. A large number of an older design of press by the same makers have been running for some years in one of our cartridge factories, some of which are equipped with as many as 12 dies in a gang. They are run about 60 revolutions per minute, thus cutting and drawing from the sheet in the neighborhood of 40,000 complete cartridge cups per day of ten hours. One operator can attend to several of them at once.

Duluth News.

A trip over the Mesabi range shows far more work under way at the various mines than might have been expected, and at least twice as many men are employed as were a year ago. While seven mines were shipping ore in the past season there will be not less than 15 in the coming year, to judge from the work that is now going on, and several of those that did late work in the past season will be very large shippers all through 1895. It has been claimed that this range and the Vermillion will be in the market to ship not less than 4,500,000 tons in 1895, and while this is undoubtedly large, it is believed by many mining men that the total will not fall short of this amount if there be no untoward calamity in the iron market. The Duluth and Iron Range and the Duluth, Missabe and Northern are each expected to handle 2,000,000 tons, while the Duluth and Winnipeg ought to be capable of shipping and to have call to handle 500,000 tons. Of the ore that will go over the Duluth and Iron Range nearly 1,000,000 tons will probably come off the Vermillion range. The other two will handle Mesabi ores exclusively.

To begin at the east end of the range—the Biwabic mine. Here the labor difficulties of the contractors have been settled and the Biwabic Bessemer Company is to do its own work. The contractors took their job at a price of 21½ cents a cubic yard for the ore in cars, getting nothing for the stripping, which at this mine is very heavy, and it was more than they could handle. Stripping by the company will soon begin and will go on all winter. The mine will have to ship not less than 650,000 tons next season to keep up to the amount which it will have to pay royalty on for the first three years, the total being 900,000 tons, of which it has shipped only 250,000 tons to this time. The Hale adjoining has been opened so that it will ship more than this year, and arrangements are now being made by the Thomas Iron Company under which it may be operated quite extensively. The Franklin, at Virginia, has a force at work, and is stockpiling, having some 20,000 tons on the dump already. The Norman, close by, belonging to the Minnesota Iron Company, will be started at the opening of navigation and will

ship largely. It is well developed, and is mined by the milling process. The Oliver can mine any amount wanted, and with the Lone Jack, which is under lease to the same parties and is now being stripped, has a minimum of 500,000 tons. The Ohio is being stripped, work being temporarily suspended, as at the Lone Jack. The Moose is under option to the Minnesota Iron Company, and is being explored. A body of manganese has been opened here. South of Virginia is the Auburn of the Minnesota Iron Company, the finest arranged and equipped property on the range. The ore from the drifts that are now being run will be put in stock for the summer. It is expected to ship several hundred thousand tons next season. This mine broke the record for ten hours' work with one skip last fall, raising 594 skips in that time. It is mined by the milling process, and its working level is 150 feet down. South of this are the Evelyn properties—the Adams, at which a steam shovel is now beginning work stripping for an output of 200,000 tons in 1895, and the Fayal, consisting of two mines bought by the Minnesota company recently for about \$300,000, which are to be operated underground, and on which shafts are being sunk. West of these properties, at Mountain Iron, five steam shovels are at work stripping the Mountain Iron and Rathbun of the Rockefeller group, and it will be no task for these mines to ship 1,000,000 tons in the coming season. If the company's actions the past season are any indication of their plans, they will do as much as they well can. Still further west are the Hibbing Mines, and at these much work is under way. The Mahoning is being stripped, 300,000 yards being under contract at 35 cents. Here there can be an output estimated to reach possibly as high as 400,000 tons in 1895. Next to this is the Sellers, where machinery for operations is being placed. The Lake Superior, which is under contract by the Rockefeller to mine 250,000 tons in the coming season, is here also, and very extensive pumping and machinery plants are going in.

Elsewhere on the range there is a good deal of exploration and there may be some other mines than these operated in the season, for several are in shape to lift ore if the conditions warrant.

On the Vermillion the Minnesota is employing about 700 men at the Chandler and about 500 at the Minnesota, the latter being a less number than usual. At both these mines there was some ore left in stock at the close of navigation, that at the Minnesota being chiefly non-Bessemer.

The year of the Sault Canal closed December 7 with the passage down of the steamship "Globe," from Duluth to Buffalo. It has been by nearly 18 per cent. the greatest in the history of the canal, with a total tonnage of 13,350,000 tons. Freight rates have been very low, the average being probably less than ever before. During three months of the season the tonnage exceeded 2,000,000 tons monthly, while on several days more than 100 vessels were passed. Largest items of traffic were as follows: Iron ore, 6,600,000 net tons; coal, 2,800,000 tons; lumber, 720,000 feet; wheat, 34,500,000 bushels; flour, 8,800,000 barrels.

It is reported that efforts are being made to form a large syndicate of Russian iron producers and colliery owners. A meeting has been called in St. Petersburg to discuss the scheme.

Relative Tests of Cast Iron.

BY W. J. KEEP, DETROIT, MICH.

Some time since the American Society of Mechanical Engineers appointed a committee to investigate the question of uniform standards in test specimens and methods of testing materials. The following is an abstract of a monograph presented by Mr. Keep, a member of the committee, at the December meeting of the society:

Relative tests are defined to be such as are applicable to every case. In such a test any size of test piece might be selected, and, having made one test record, every other record by the same method is so much greater or less than the original, which is regarded as standard. There is a direct relation between the test record and the composition of the iron, also between the record and size of the casting, and also its shape. A relationship also exists between the test record and the conditions attending the melting and handling of iron and the making of the castings. It is the object of the paper to provide a means for determining the physical quality of a casting of any size or shape from the test record of any size of test piece which it may be thought best to use.

In the present series of tests it was decided to make enough test bars of definite composition, and of such sizes as would establish, experimentally, the relationship between the physical quality of test bars of any size and form that had ever been used for cast iron. We could then make rules and construct charts, by which a test record of one size of test bar could be turned into the record of a test bar of another size. We could reconstruct formulae which might be found incorrect. We could show by charts and diagrams the influence of a change in composition on any size of casting.

Pig Iron for Tests.

We desired to use gray iron with as low silicon as would be used in any foundry making gray iron castings. Iroquois Furnace Company of Chicago sent us 3 tons of No. 3 Mal Bessemer pig iron, of clear uniform gray fracture, very strong and tough in the pig. It contained TC 4.07, GC 3.15, CC 0.92, P 0.23, Si 0.88, S 0.035, Mn 0.50. This iron was made from Lake Superior ore with coke.

The Ashland Iron & Steel Company of Ashland, Wis., also sent us 3 tons of charcoal pig iron, brand Hinkle, also from lake ores containing TC 3.507, GC 2.69, CC 0.817, P 0.13, Si 1.09, S 0.016, Mn 0.72. Both of these companies analyze each cast and furnish iron on a guaranteed analysis when required.

The Pencost ferrosilicon, by which silicon was added to these irons, was made at Bessic Furnace in the Hocking Valley district, from carbonaceous ores with coke. It contained TC 2.833, GC 2.072, CC 0.761, Si 10.87 (another analysis of another pig gave 10.27, and still another 14.77), P 0.49, S 0.142, Mn 0.70.

Six series of test bars were made with Iroquois pig iron; six series with Hinkle pig iron; three series with De Bardeleben pig iron; two series with Hinkle and scrap iron.

Description of Test Bars.

Each test bar for transverse testing was cast horizontal, two bars exactly

alike being run from the same gate, which was set so as to feed the iron from the under side of the casting. There was one gate near each end of the mold. This arrangement made the lower half of the casting solid, and imperfections on the upper surface would do comparatively little harm. Cast iron yokes were bedded in the sand so that parallel iron surfaces should form the ends of the mold to chill each end of the bars, and to permit of the measurement of the shrinkage of the bar.

Series were to be made containing 1.00, 1.50, 2.00, 2.50, 3.00 and 3.50 per cent. of silicon, which would represent all gray iron mixtures for machinery and light castings. To represent all sizes of bars in use, and all sizes of foundry machine castings, the following test bars were made in each series:

Two test bars 1-10 by 1 by 12 inches.	Keep's size.....
Ten test bars $\frac{1}{2}$ inch square by 12 inches.	Engineers
Two test bars 1 inch square by 14 inches.	Architects
Two test bars 1 inch square by 26 inches.	Water works
Two test bars 1 inch square by 50 inches.	Heavy castings.....
Two test bars 1 inch square by 56 inches.	For comparison....
Two test bars 1 by 2 by 14 inches.	
Two test bars 1 by 2 by 26 inches.	
Two test bars 2 inches square by 26 inches.	
Two test bars 3 inches square by 26 inches.	
Two test bars 4 inches square by 26 inches.	
Four test bars 9-16 inch round by 12 inches.	
Two test bars $\frac{1}{2}$ inches round by 14 inches.	

For tensile test the following bars were made in each series:

Two test bars, $1\frac{1}{2}$ -inch 0 x 12 inches, with spherical heads; two test bars, $1\frac{1}{8}$ -inch 0 x 12 inches, with spherical heads; two test bars, $1\frac{1}{2}$ -inch 0 x 15 inches, to be turned to $1\frac{1}{2}$ inches, or 102 bars in all for tension.

For compression, cylinders were turned from the broken ends of the last named bars.

The paper then describes the foundry work, the required castings being made by the Detroit Stove Works, and presents data regarding the depth of chill at each end of the test bars.

Shrinkage of Cast Iron.

The general understanding is that the shrinkage of a casting is the difference in length between it and the pattern from which it was made or between it and the mold in which it was cast. It is given in thousandths of an inch per foot of length. A pattern maker's shrink rule is $\frac{1}{4}$ inch longer than the standard foot, as for practical purposes cast iron is estimated to shrink $\frac{1}{4}$ inch to each foot of dimension. As a matter of fact, the shrinkage is a very variable quantity, and is influenced by the composition of the iron used, and by the size and shape of the casting. The fluid iron by its specific gravity fills every portion of the mold. That which touches the mold cools and becomes solid by crystals forming on all such surfaces. New crystals form on the inner surface of this shell until it becomes rigid. As soon as this shell is formed, it begins to contract in every dimension, and this continues until the casting is perfectly cold. In all castings, on the formation of each crystal, a portion of the contents of the cast iron crystallizes out and is caught between the crystals of iron. The principal element which thus separates is graphite. The size and compactness of the crystals is due to the size of the casting, and is a secondary cause of variation in shrinkage. All carbon in fluid iron is supposed to be combined with the iron, and fluid iron is capable of holding more carbon in combination than it could hold when cold. For this

reason pig iron that is saturated with carbon, that is, contains all that it can dissolve and hold when it is melted, will be gray when it solidifies, on account of the particles of black carbon being caught between its crystals. Silicon lowers the saturation point for carbon at the temperature of solidification of the iron, so that, by adding silicon to cast iron that is not gray, it will become so.

Action of Silicon.

Silicon of itself increases shrinkage and hardens cast iron, but by its influence on carbon—that is, by driving it into the graphitic state—it softens the casting and decreases shrinkage. We therefore say that silicon in foundry mixtures controls shrinkage and softens cast iron. When a further portion of the fluid metal inside the shell solidifies, it also shrinks and tends to pull

toward the shell, and when the last portion of the center crystallizes, there may not be enough to fill the spaces and form a solid casting.

If a cavity is likely to be left at the center of the casting, by churning the metal in the gate a connection may be made to the open spot, through which fresh fluid metal may be fed to fill such cavity. The slower a casting cools the larger will be the crystals; therefore a large casting will shrink less in its outside dimensions than a small casting from the same metal.

The amount of shrinkage then varies:

1. In proportion to the total quantity in the pig iron.
2. In proportion to the percentage of silicon present.
3. In proportion to the size of the casting.

It has been stated that a close grained pig iron with 2 per cent. of silicon will produce as soft a casting with as low shrinkage as a pig with 2 per cent. of silicon with a dark, open grain. Castings from foundry or gray forge or No. 3 pig, with the required silicon added by a silvery iron, will generally have a higher shrinkage than if made from pig iron containing the silicon required in the casting. As an example, take the following extreme case: Gaylord white pig iron (Si 0.18), with Si increased to 2.42 per cent., gave shrinkage 0.160. F. L. M. gray pig iron (Si 1.25), with Si increased to 2.41 per cent., gave shrinkage 0.140. The silicon in some silicon irons will exert more influence than that contained in others.

The treatment of the iron in remelting and in handling before it reaches the mold influences shrinkage, hardness and strength. For example, the iron that first comes down on to the cupola bottom is harder and has a higher shrinkage than that which comes after the cupola is thoroughly hot, though it may contain more silicon. Iron as it comes from the blast furnace generally has a less shrinkage and is softer than after being melted in a cupola. As the conditions vary in different shops, and as different mixtures give different results irrespective of the percentage of silicon, the percentage of silicon neces-

sary to produce a given result can only be approximated. But in one shop with substantially one mixture the shrinkage record will vary in proportion as silicon varies.

Chart 1 illustrates graphically the shrinkage of each size of test bar of the six series of Iroquois iron, and also shows the shrinkage of Southern, Ala., pig iron. Chart 2 shows the shrinkage of the six series of Hinkle. Chart 3 is constructed from the results of the Iroquois and the Michigan Stove Company Southern series.

Example 1.—Wanted to make a cylinder 3 inches thick. The shrinkage of a $\frac{1}{2}$ -inch test bar from the iron mixture is 0.153. What percentage of silicon

the curve to a silicon scale, and we will find the silicon to be 2.25.

Example 2.—Having 0.153 as the shrinkage of a $\frac{1}{2}$ -inch square bar, it is desired to reduce this record to that of a 1-inch square bar. Find 0.153 on the left hand side of the chart, carry it across to the perpendicular corresponding to ratio of a $\frac{1}{2}$ -inch bar (0.125), run down the curves until the line corresponding to the ratio 0.25 of a 1-inch square bar is reached, which shows a shrinkage of 0.128.

The shrinkage of a bar 1 x 2 inches (0.116) can be found in the same way.

If we had used a 1 inch square bar we could from the chart reduce its record to that of any other size.

In the study of the influence of other elements, if the silicon and conditions are kept uniform and a single element is varied the variation in shrinkage will be due to that element. For this practical use no other size of test bar will answer. In a 1-inch square bar, and more so in those of larger dimensions, the secondary influence of the increased size of crystalline structure varies the record oftentimes more than the composition of the iron. It is true that in large castings this secondary influence completely overshadows the influence of composition, and thus prevents the large test bar from indicating the composition. The $\frac{1}{2}$ -inch bar gives the information needed by a founder regard-

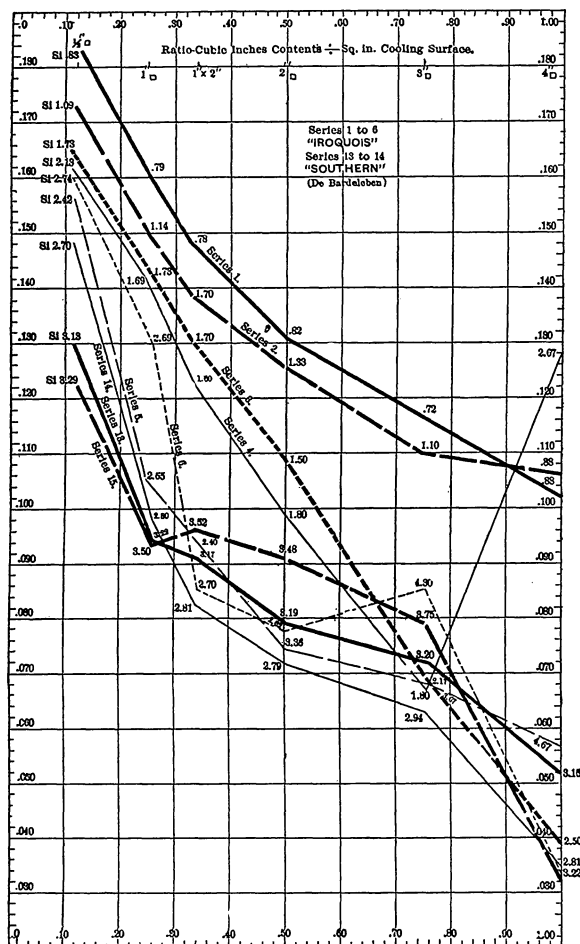


Chart 1.

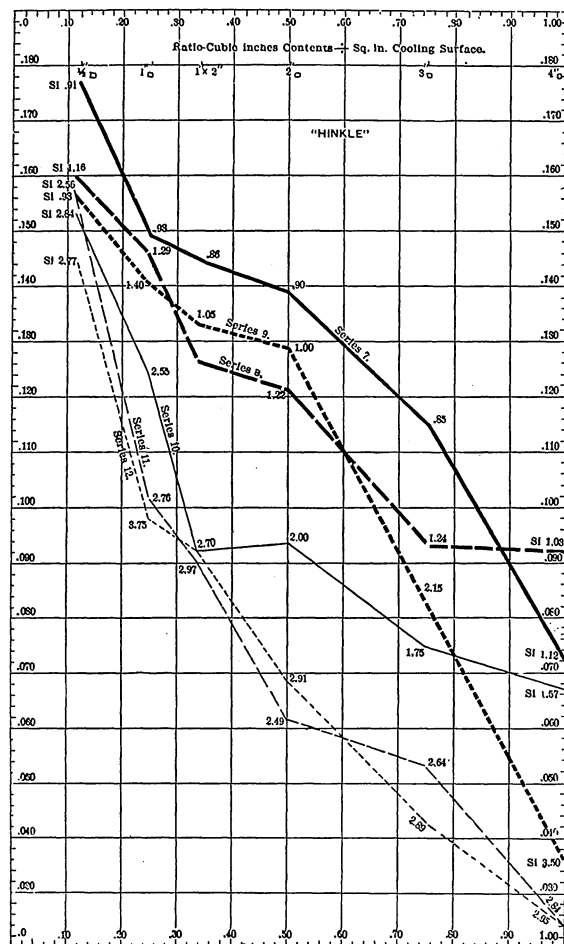


Chart 2.

RELATIVE TESTS OF CAST IRON.

does it contain, and what will be the shrinkage of the casting?

Take a strip of the casting of any size, say 10 x 1 inches; this contains 30 cubic inches and 20 square inches of cooling surface; 30 divided by 20 equals a ratio of 1.50. In Chart 3 find shrinkage 0.153 on the left hand margin. A parallel line will cut the silicon scale at 2.25, which is the approximate silicon. Follow between the curves until the ratio 1.50 is reached (in this case outside the chart), and it will be found that the approximate shrinkage of the casting will be 0.062.

If it had been required to make a casting of these dimensions with a shrinkage of 0.062, which had been found satisfactory for hydraulic cylinders, and it was required to find the silicon in a mixture to produce such a casting, follow down the ratio 1.50 until 0.062 is reached, then run along

The One-Half-Inch Test Bar.

In the study of cast iron, and in the control of a foundry mixture, the $\frac{1}{2}$ -inch test bar has an advantage, for it is so small that it is only influenced by the composition of the casting. Therefore its record is a mechanical analysis, telling whether more or less silicon is required. It gives this information better than a chemical analysis, because it takes into account not only the influence of all the elements entering into the composition of the iron, but it also takes into account all local conditions and the nature of all the irons used in the mixture. It also tells its story in a definite way, and does not require the trained judgment of an expert to make it of practical value. Whatever may be due to influences outside of the silicon contained in the casting, an increase or decrease of silicon will lower or raise the shrinkage.

ing composition more accurately than any other known method. By Chart 3 the change due to size can be approximated. The use of a larger test bar and by finding (in Chart 3) the record of a $\frac{1}{2}$ -inch bar would make the composition approximate, which is the one thing that should be definite. The influence of any test bar record on the final casting must be approximate any way, because the size will necessarily vary, and outside complications will also exert an influence.

Use of Chart 3.

From this chart a founder can at a glance see the difference in shrinkage between the different parts of a casting on account of size and the strain incident thereto. He can tell from the shrinkage of any size of test bar which he may use the shrinkage of any casting, larger or smaller, from the same

mixture. If he knows the size of a casting and the shrinkage that is desired he can find this result on the chart, and by following the curved line either way can find approximately the percentage of silicon which the iron mixture should contain to produce this result. The figures at the top of the chart denote the ratio of cubic inches in the casting to the cooling surface. The cubic inches in casting divided by the square inches of cooling surface—the figures on each side denote the shrinkage, and the curved lines show the percentage of silicon in the casting.

Discussion.

The discussion of Mr. Keep's paper was animated, and as evidence of the

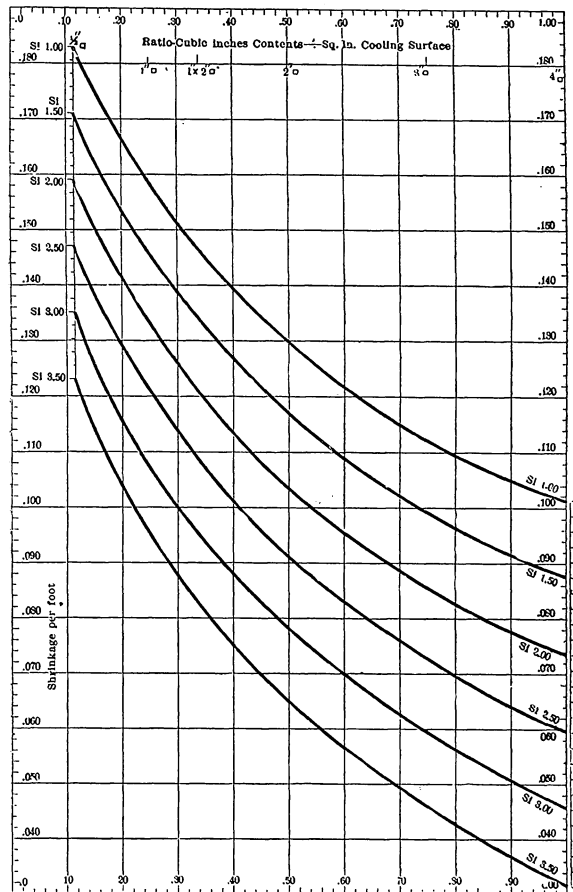
inch. Taking a 4-inch bar, the 1 per cent. silicon gives 0.102 shrinkage, the 3 per cent. silicon gives 0.045 shrinkage, a difference of 0.057 per cent. This is a very slight difference, as the contour of the curves would show; the whole indicating that any one size of bar is as good as another for the relative test of shrinkage. The irregularity in the chill tests I believe to be entirely due, as Mr. Keep suggests, to the washing of the chilling surface, because it is well known that if a chilling surface is heated by iron washing out over it, it will chill less deeply than if cold. Plans have been adopted for keeping the chilling surfaces cool, so I believe we shall have in the future more satisfactory results of chill tests than

we ran down certain heats and then poured as fast as we could after tapping. When such large masses of material are handled other precaution must be taken than those involved in simply casting 20 bars out of one ladle. But the fact that the bars were every one perfect shows that the method was not very far defective.

W. J. Keep: The paper is a description of 15 series of castings made from irons with different percentages of silicon, for the purpose of deciding the physical properties due to the chemical composition and also due to the different sizes of casting. The only subject that this paper treats of is shrinkage, leaving the question of strength and all the other portions of the subject for the summer meeting. We have the data for the work of the summer meeting in blue print form, and having the data, some of the conclusions reached in this paper are based on the chemical compositions of metals, which we do not give, because they were not received within two or three days of the time of coming to this meeting. The first subject of the paper, after describing the foundry routine, is the question of chill. I did not intend that the remarks on chill should go beyond the description of the actual facts ascertained in these test bars. If it is a matter of interest the committee will take up that portion of the subject and make tests specially to determine chill. Then again a few pages of the paper are devoted to exceptions showing that it is impossible in foundry work to have everything as definite as you would like. The latter portion of the paper treats of shrinkage, and then a chart—an ideal or an approximate chart—is made, by which a founder may determine from the shrinkage that he wishes in the casting the amount of silicon that is necessary.

E. F. C. Davis: What I would like is to find out some rule by which we can put iron into the cupola with some degree of certainty that we are going to get castings that will be strong, wear well and not be too hard to finish. I think if these three points were borne in mind, no matter whether we arrived at it through silicon as the key, or by any other method, it will be just what users of castings are most anxious to find out about.

John Fritz: I have had some little experience in making heavy castings. In arranging for casting a number of the same pattern weighing 160 tons each we placed about 700 or 800 tons of metal of different brands of the best iron available on the bank. We had an analysis made and then mixed the metal in the pile as thoroughly as possible. A section of the heaviest part and of the lightest part of the casting was made and castings were produced to correspond. Some of them weighed 3000 and some 4000 pounds. Tests out of all parts of them were taken. We desired strength more particularly, and wanted a metal that would stand 22,000 or 23,000 pounds. After we had that all done we made the castings. The result was they all came out about what was ordered and the shrinkage of all was about the same. The difference of the heat of pouring metal is an important matter, but it is unfortunately something that we cannot regulate. I have not been able to get a pyrometer that anybody could handle—anybody who was not a professor from some university, and very few of them could do it. Consequently we had to go by the rule of



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Chart 3.

RELATIVE TESTS OF CAST IRON.

interest excited, it may be noted that repeatedly members returned to the subject, while other papers were up. An entire afternoon was set aside for the purpose.

E. H. Mumford of Henry R. Worthington, Elizabethport: I simply want to call attention to the fact that this paper leaves out the question of strength entirely, as that has to be considered later, the data not having yet come in. Of the three elements of strength, shrinkage and chill, both the strength and the chill have a certain amount of importance, but in my opinion the shrinkage is the matter of the greatest importance, and the plotted chart in Mr. Keep's paper from actual tests of shrinkage shows a very valuable conclusion. The shrinkage of a $\frac{1}{4}$ -inch bar due to changes of mixture, with 1 per cent. silicon, he chronicles 0.183 shrinkage, with 3 per cent. 0.135, a difference of 0.048

are given in the paper. The main value of the report, so far, preliminary as it is, is in the proof that one size of bar is as good as another for showing relative results.

Gus. C. Henning: The fact that all the bars without exception were perfect is good evidence that they were a pretty good set of bars for the purpose. That fact is not stated in the paper because the bars had not all been tested. The fact that the metal was not all poured into a ladle and then stirred up is one that would act against the quality of the iron, and in future tests that I have asked for we will probably do that. When all the metal was melted down in the cupola and left there before it was drawn out we tried unsuccessfully to do that. If the metal had been poured from the big ladle into several other smaller ladles we would not have known what the iron in the last ladle or the second or third ladle was. So

thumb. But I will give you a little experience in making light castings. A machine tool builder who was making a great many pulleys some years ago got into trouble because his castings were white. I sent him 5 tons of No. 1 and 5 tons of No. 2, and told him to mix them half and half and pour them fast and pour them hot. The foundryman urged that the iron was not No. 3, let alone No. 1 and No. 2. The iron was a close grained iron. It had close spots and it condemned the iron and nobody would buy it. But this gentleman had faith in what I told him, and the result was we sold 2400 tons of iron to them to make pulleys, and they never lost a casting. Those close spots in the iron do not hurt it. The iron was rather high in silicon, but the iron that we used for heavy castings was not. The iron used for heavy castings ran about 1.25 per cent.

William Kent: The practical founder has known for many years that the shrinkage of cast iron is $\frac{1}{4}$ inch to the foot. Mr. Keep has put into his paper a diagram showing that the shrinkage of iron is not $\frac{1}{4}$ inch to the foot, but something else, and if you want to know the shrinkage of iron you must put a microscope on his diagram and analyze it for the silicon. It happens that the average of this diagram is 0.125. Let us analyze it in detail. We find that the ratio of cubic inches of contents divided by square inches of cooling surface is very small when we have a small thin piece. Now, the practical founder, if he has to make a very small casting, or a very thin casting, will make it pretty high in silicon—that is, he will put in 3 per cent. of silicon—and with that small casting he will get a shrinkage of $\frac{1}{4}$ inch to the foot. If, like Mr. Fritz, he wants to make a very large casting equivalent to this bar, he will come down to 1 per cent. of silicon. For an intermediate casting between the two 2 per cent. of silicon is chosen and the same shrinkage is obtained, so that the practical founder without knowing about silicon, but knowing about the grades of iron sold in the market, will put in a very close grained iron. So that my proposition is that, in accordance with Mr. Keep's diagram, what the practical man uses brings out that percentage of silicon and the shrinkage is $\frac{1}{4}$ inch to the foot.

Robert Cartwright: There has not been the first reference to a very important and essential feature in foundry work which practical foundrymen know, and that is, if I may so term it, the ferrostatic head of iron upon a mold; that is what makes the difference in the shrinkage as much as anything else. Some 22 years ago I had occasion to make a lot of piers $8\frac{1}{2}$ feet in diameter, $1\frac{1}{2}$ inches of metal and 10 feet long, with an external flange. Now, does anybody suppose that a practical foundryman would make that mold parallel? In making the first one I spent \$30,000. I made 320 of them and lost only one. I did not go into figuring so much silicon.

Mr. Cartwright described in detail, illustrating it with sketches, his method of making these castings, which were used for the piers of the Kansas City bridge. He referred also to a hydraulic press made in 1855 for a lined oil works. He selected two good brands of iron and ran them into pigs so as to refine the iron, and repeated the operation before pouring. The cylinder was hauled 14 miles through a hilly country, and though the cylinder was as smooth as a looking glass inside, it failed ut-

terly as soon as the pump was started. A friend suggested that he use as a material for the next casting old gas retorts and old grate bars, &c. That led to a success. Mr. Cartwright added:

Had I that to do to day I would cure it in just 15 minutes. When you get a hydrostatic cylinder that leaks, it is porous may be. Buy some mackerel brine, give it a pressure and let it lie 24 hours and you have got the tightest cylinder that you can get.

John T. Hawkins: I would like to say a word as to the inability of this diagram to determine the shrinkage of iron. As I understand it from cursorily going over the part relating to it, all other conditions being equal, it simply defines the variation in shrinkage occasioned by the variation in the amount of silicon in the iron. The author says: "It also tells its story in a definite way, and does not require the trained judgment of an expert to make it of practical value. Whatever may be due to influences outside of the silicon contained in the casting, an increase or decrease of silicon will lower or raise the shrinkage." Now, while the table may be available as simply applicable to the knowledge of what effect silicon has upon the shrinkage, it is of very little use to enable us to determine what the shrinkage is going to be in a particular piece of cast iron. I have not heard in this discussion that one of the principal things that affects the shrinkage of a casting is the temperature at which the iron is poured. As a guide for determining the amount of shrinkage of castings, the most important factor of all is left out if we disregard the effect of the temperature at which it is forged.

Gus. C. Henning: The Hinkle chart plots six series of tests, each series consisting of a great many tests. The ratio of cubic inches of contents to square inches of surface shows that account is taken of the temperature, because the larger the ratio of contents to cooling surface the less rapidly will the material cool. In the other column are given the shrinkages in inches per foot of length. The larger the castings are the less the shrinkage will be. The silicon found by chemical analysis in each series is given at the beginning and at the end of the line. Now that chart shows clearly that there is a distinct relation between temperature in the flask and shrinkage in the material poured. In the first case, silicon 0.91, series 7, the heavy black line on top—it is just as plain as in the last one, although the irons are quite different; the shrinkage decreases as the size of the part increases. That shows that the shrinkage is controlled by something else than the composition. But in every case the shrinkage is less per foot as the casting increases. With all these facts before Mr. Keep and thousands of others in the regular routine work of casting he has plotted his ideal chart. Those curves, of course, are abstract, theoretical. They do not take into account conditions which may disturb the effect. They do not take into account accidental changes due to fuel nor the loss in silicon in the cupola during melting. But the general law laid down in those smooth curves is found to hold good in every case.

The variations from the ideal lines in the charts representing actual series of tests are produced by conditions that could not be controlled in the foundry in every case. As experience is multiplied in casting the same bars these errors will be eliminated; some of these differences here may be corrected, as

more experiments are made, but in every case it will be found that the shrinkage decreases with the size of the casting, and that the shrinkage decreases with the amount of silicon in it, provided all the conditions under which those pieces have been made were identical. If we had had larger castings, more than 4 x 4 inches, we might have found out something about those, although of course there would be other things which we have not been able to determine. Should we be able to get at definite conclusions with regard to smaller bars, which is a task of infinite pains, we hope to be able to carry these curves out further, so that we can with one or two actual trials of a larger casting determine whether our curves will hold good for larger castings as well, and by interpolation we can get approximate values of shrinkage for any size of casting, provided that the casting was made under the same condition as the little casting, which every foundryman makes for himself. It will be observed that any one iron has a great many percentages of shrinkage, and which are entirely due to mechanical causes irrespective of the chemical composition.

J. F. Hawkins: I merely want to insist upon the point I have made that has not been touched upon yet, that the temperature at which castings are poured varies the amount of shrinkage of the castings very greatly and more than some of the conditions named here. For instance, it will influence the amount of shrinkage in the castings more than the disparity in the sizes. We will assume that if you have a number of castings of uniform dimensions to cast, if all these conditions are observed that are given in this table, you will have uniform shrinkage provided you pour them at the same temperature. If you do not pour them at the same temperature you will not have the same shrinkage, though you observe all those conditions. The shrinkage of castings is influenced as much by the temperature at which they are poured as by any of the conditions that are named there.

Gus. C. Henning: I would like to say that one of the conditions under which these test pieces are prepared is that the temperature must be the same at the time of pouring. We do take it into consideration, inasmuch as we get out test pieces cast as nearly as possible at the time a good founder decides that it is at the same temperature. We admit that the work may be incorrect for that reason. But you will find that such errors eliminate themselves in a great series of experiments. If any one will tell us how to measure the temperature of the molten metal in the ladle we will do it. The grain depends very largely upon the temperature. If you anneal the castings the grain will be altogether different. If you make a small casting you will get one grain of one iron. If you cast six pieces of different sizes the grain will vary in each one of them, although they were poured in the same heat and the same flask. If you pour these six pieces in different flasks, all from one ladle, the grain will again be different, because the smaller pieces cast with the larger ones will change their grain under the temperature effect.

Thos. D. West: Altogether too much attention has been paid to silicon. Of course, as Mr. Keep has defined for us, silicon is an element to largely control our mixture, but I have found in my experience for the last three years with chemical analysis that I have to watch the sulphur contents closer than the sil-

icon; that the least change in a few points of sulphur would make a radical effect in my castings. We, in our business, make a specialty of ingot mold work, and the life of those molds is what regulates their value, and it has taken us some time to find just what is the right percentage for each of those elements to have in our metals. Our iron comes to us in buggy loads of 3 tons from a couple of furnaces close by us, and with every buggy load we have a card stating the chemical analysis of the silicon, sulphur, manganese and phosphorus. Those four qualities we follow, paying no attention to the carbon. In a series of experiments which I have made with regard to solving the question whether sulphur is beneficial or not, I found that it strengthens the iron, and that the lower the silicon the greater is its influence to strengthen the iron.

Robert Cartwright related his experience with a foundry whose troubles he investigated. He found that the

took it from to-morrow's cast, make them a little trouble. Practically to eliminate that difficulty I have always been in the habit of laying out casts in long horizontal layers, one on top of the other, until the iron is stacked as high as it is convenient. When it is sold to customers it is cut down off the ends.

J. F. Hawkins described the method of making a fly wheel exhibited in 1873 by the Jackson Architectural Works of this city. The rim and hub were very heavy, while the arms were light. The wheel was successfully cast by molding in between the arms large blocks of cast iron, having a partition of sand between them. The whole was poured together so that the heat in the large pieces protected the arms and the latter cooled at the same rate.

John Fritz: Internal strains are very ugly things. I cast the rim of a fly wheel at Johnstown a good many years ago all in one piece. The hub and arms were made in another. Some Pitts-

The Perfection Friction Clutch.

The Perfection friction clutch made by the Hartford Machine Screw Company of Hartford, Conn., is especially adapted for use in cases where instantaneous reversing or releasing is required. Its construction is shown in the perspective view, Fig. 1, the several parts being shown separated in Fig. 2. Mounted on the sleeve is the collar, shown at the left in Fig. 2, which is splined to the sleeve so as to revolve with it, and so as to be moved parallel with the shaft. The friction band is open at one point, and in this opening enters the wedge shaped piece shown at the bottom of Fig. 2. The two short bars bear in recesses formed in the sliding collar and in the wedge, and also in that portion of the band opposite the opening. It will be seen that a slight movement of the collar toward the cone pulley serves to expand the ring, the grip being at once

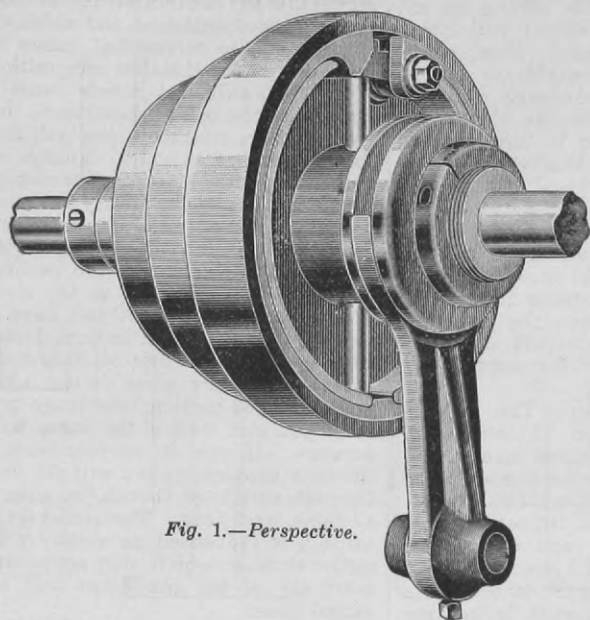


Fig. 1.—Perspective.

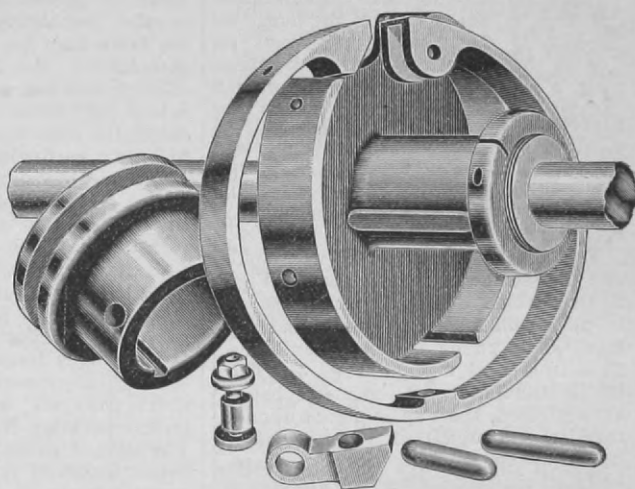


Fig. 2.—Showing Parts Separated.

THE PERFECTION FRICTION CLUTCH.

founder had bought a lot of cheap gas coke, but the partition between it and the Connellsville coke had been broken down, and the founder was trying to melt iron with gas coke.

W. F. Durfee: Some years since I had charge of a large iron works built with several blast furnaces making foundry iron. We were selling to a large pipe works a grade of iron that they had been using for a long time with entire satisfaction. The charge of our furnace was practically uniform, and the iron was as uniform as pig iron was liable to come. One day the proprietor of the foundry reported that the whole heat of pipes was spoiled, and attributed it to the iron. Upon investigation we found that for that particular heat of pipes the molds were not ready in time. The cupola was full of iron up to the tuyeres, and they kept on blowing and were burning the carbon out of the iron. In fact they had turned their cupola into a refinery, and the result is that that particular heat of pipes was all white iron. In making pig iron the different casts will sometimes vary. In selling pig iron to a foundry for a given purpose the buyer might get good results to-day, and the iron to-morrow might possibly, if the

burgh men came to see it and they concluded that they could do a great deal better than that. They cast the wheel all together, hub, arms and all. To my surprise the thing stood together and got out, and they were so much pleased with it that they gave the molders and the men who did the work \$50 to go out in the woods and have a spree. When they came back they found the wheel in two pieces about 50 feet apart.

W. F. Durfee: Mr. Hawkins' sketch has called to mind an experience of my own. I made a drawing of a wheel for a certain piece of machinery. The spokes were wrought iron and the rim and hub were cast iron. I took that down to the foundry, where they were eminently practical, and the foreman of the establishment claimed that it was impossible to make, because the shrinkage would tear that all to pieces. Mr. Durfee taught him that the work could be accomplished by casting the rim with the wrought iron arms on one day and pouring the hub on the next day.

New Orleans capitalists are arranging for the construction of a large ship-building plant and marine railway at that port.

sure and powerful. The reverse movement provides an instantaneous release. The clutch may be opened and closed by a $\frac{1}{16}$ inch movement of the collar.

The Bethlehem Iron Company have shipped to the Brooklyn Navy Yard four Harveyized plates for the last turret of the new battle ship "Maine." This shipment completes the delivery of armor for that vessel.

The International Metal Company, with principal office in New York City, was incorporated on December 13, with the Secretary of State of New York, to carry on business of mining ores and of dealing in the products of ores, not including the buying of gold and silver bullion or foreign coins. The locality of the business will be in the States of New York, Colorado, Idaho, Montana, California, Nevada, and South Dakota and in the Territories of New Mexico, Arizona and Utah, and in the States of Coahuila, Chihuahua and other States in the republic of Mexico. The capital is \$1,000,000 and the directors, Nathaniel Witherell, Charles Francis Adams, Robert S. Towne, Theodore Berdell, Edward M. Shepard and Edward Brush of New York City and Augustus R. Meyer of Kansas City, Mo.

The Manufacture of Tubular Articles.

From United States letters patent issued to C. T. Cayley and R. S. Courtman of London, England, and assigned to the United States Projectile Company of Brooklyn, N. Y., we take the accompanying engravings and present the following description of a method of making tubular vessels or bottles for containing gases under pressure. The vessel is made from a solid block of metal, the various steps in the process of manufacture being illustrated in the drawings, Figs. 1 to 10. Fig. 1 is a view of the solid block, Fig. 2 shows the block after it has been pressed to the shape of the bottom of the mold. Fig. 3 is a sectional view of the block after it has been cupped by the action of a punch. In Fig. 4 the cup has been drawn by one or more operations, while heated, nearly to the length, diameter and thickness of the finished article. In Fig. 5 the cup has been swaged down and closed at one end to enable it to be drawn through a die and over a mandrel as shown. Fig. 6 shows the completed blank, formed from the partly completed blank seen in Fig. 4, by subjecting the latter to a process of cold drawing. Fig. 7 shows a bottle completely formed from the finished blank, Fig. 8 shows the method of closing the end and Figs. 9 and 10 show the dies used successively in this process.

The block is first placed in a mold and pressed to the shape shown in Fig. 2, after which, and at the same heat, it is placed in a second mold and by means of a punch is worked into the form of a hollow cup, Fig. 3. The initial tubulation of the metal being thus effected, the cup is placed upon a mandrel and submitted to a process of hot drawing through dies of successively diminishing size, to which the blank is subjected in proper order, being reheated as often as may be necessary. The block has now been brought substantially to the shape shown in Fig. 4. If the blank is to be used in manufacturing a tube about 4 feet or less in length, it may be finished by merely subjecting it to a process of cold drawing by which it is reduced to the proper length and thickness and brought to the exact diameter required, thereby constituting a complete, finished metallic blank, ready for use in the process of manufacture of the complete, finished tubes, bottles, or tubular vessels about to be described.

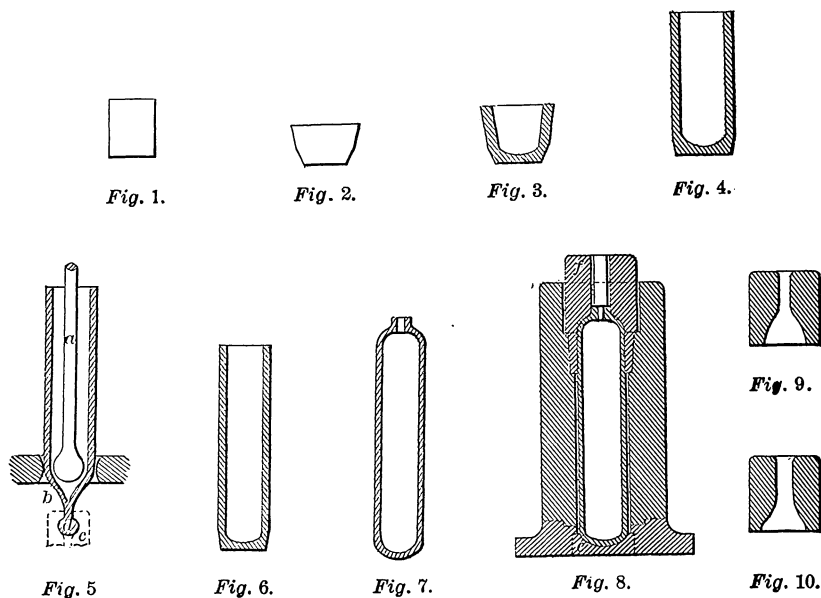
We take the following description of the process for lengths greater than 4 feet: "If, however, the tube, bottle or tubular vessel is to be of greater length than 4 feet, or thereabout, we can, by known methods, subject the blank described above to the action of rolls, after having punched, cut or otherwise removed its closed end and inserted a mandrel, said rolls having a series of grooves of diminishing size. After reducing it very nearly to the length, diameter and thickness it will have when finished, it is preferably pickled, to remove the oxide, or scale, from its surface, is then subjected to an annealing process and finally finished by cold drawing. By the latter process we are enabled to reduce the metal to any required thickness, however slight, and we impart to it great strength, stiffness and toughness. We may use for this cold drawing process any known method, but we prefer that illustrated in Fig. 5 of the drawings. This method consists, substantially, in closing and

swaging or shaping the end *b* of the tube in such manner as to form thereon a strong, prolonged neck, or shank, 4, provided at its extremity with a knob or other suitable holding device, *d*. This device is placed within the grasp of jaws *c*, reciprocated by any suitable means. Within the tube we insert a mandrel, *a*, having upon its end a ball of such size as to impart the proper interior diameter to the tube. The exterior diameter is imparted by means of a circular die, having its edge convex, or rounded, and lying in suitable position with relation to the interior device *a*. The cold drawing may be completed at a single operation, or it may be effected by repeatedly drawing the tube, the diameter of the die and mandrel being slightly diminished at each operation. By this process we produce not only tubular blanks suitable for the manufacture of bottles or tubular vessels capable of holding gases under pressure, but we can also form tubing sections of any suitable or ordinary length, diameter and thickness.

which is passed down through the bore 17 in the die to form the opening in the neck which is to receive the valve."

The United States Projectile Company of Brooklyn are using the process in the manufacture of bicycle tubing, using special Swedish steel billets.

D. P. Jones & Co., 531 The Rookery, Chicago, have been appointed United States representatives for the products of Professor Tincq of Paris, namely, Selenifuge for the preservation of boilers and Frigorifuge for the prevention of freezing or congealing of water. Captain Jones of this firm is a retired chief engineer of the United States Navy. He has thoroughly investigated the merits of these preparations and is especially pleased with the peculiar properties of Frigorifuge. It is extensively used in France to prevent the freezing of water in pipes, hydraulic apparatus, gas meters, ice machines, tanneries, &c. The liquid is guaranteed to be absolutely neutral, and is therefore harmless to all metals. Greasy



METHOD OF MAKING TUBULAR ARTICLES.

"In the manufacture of blanks for the production of bottles we operate upon a solid block of steel or iron by substantially the same method as that described until it is reduced to the form shown in Fig. 6, the blank being of a length somewhat in excess of that of the bottle when the latter is finished. We then cut off the surplus length from the upper or open end of the tube, and turn or otherwise shape the bottom or closed end, to bring it to the required shape and thickness. The open end of the blank is then heated and placed in a mold, Fig. 8, in which the open end of the blank is to be closed and its neck formed. At the lower end of the mold is a block, *e*, to support the blank against the action of the die *f*, or dies, Figs. 9 and 10. These dies, when more than one are used, operate successively, preferably by hydraulic pressure. The matrix recess in each die is successively approximated to the complete or finished shape, until the last is reached, which imparts the necessary form. The matrix recess in each die opens into a concentric bore having a form adapted to receive and aid in forming the neck of the bottle, this operation being completed by the use of a mandrel having a reduced end,

fittings or lubricating oils are not saponified by contact with it. Another property is that it is soluble in all preparations of water, insuring homogeneity of the saturation in all parts of the space in which water may be confined. Further, it is not volatile, can be used over and over again, and is not susceptible to changes under various atmospheric influences or temperatures, nor does it form a deposit or sediment. Very remarkable claims are made as to the power of this liquid when mixed in certain proportions with water. For instance, if mixed with water in the proportion of 15 per cent., it prevents freezing to 10½° F.; 20 per cent., it prevents freezing to 1° F.; 25 per cent., 6° below zero; 35 per cent., 13° below zero; 40 per cent., 18° below zero; 45 per cent., 24° below zero. If used pure, it prevents freezing to 49° below zero.

The Cunningham Bedford Rocket Torpedo Company of New Bedford, Mass., have been given permission to withdraw their weapon now awaiting trial at the Newport Torpedo Station, in order to make some radical changes in its construction. Among these is the fitting of a cage from which to launch the torpedo, instead of through a tube.

Open Hearth Steel.—IV.*

The Smith Casson Furnace.—Figs. 18 and 19. This furnace has overhead reversing regenerators and is working on a 20-ton basic charge at Round Oak Works, England. The two gas chambers are above the air, and the gases unite in the furnace through three air and two gas ports. The advantages of this arrangement depend in a measure upon the nature of the soil and on the space available and positions may be conceived in which the economy in first cost may be very marked. The charge is 60 per cent. of pig iron containing $2\frac{1}{2}$ to 3 per cent. of phosphorus, and 40 per cent. of scrap, and the fuel used is 1200 pounds per ton of ingots.

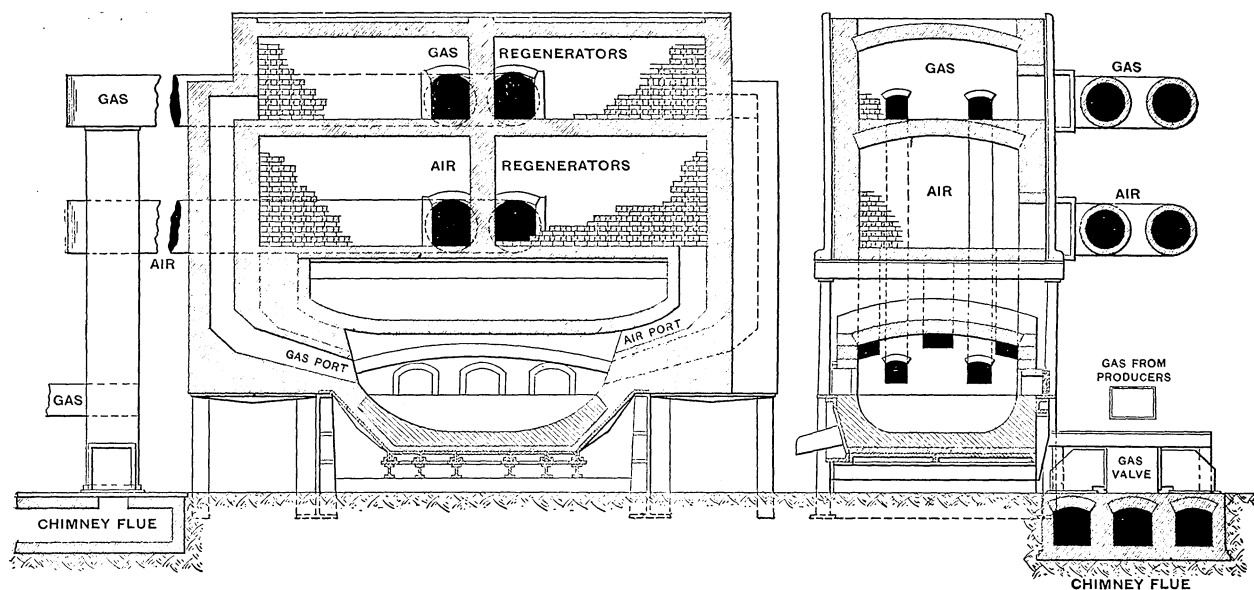
Accelerating the Process.—Much attention has been directed to the possibilities of accelerating the oxidation of the bath, especially where pig iron forms the bulk of the charge. Mechanical acceleration by the use of hydraulic or other charging machines for shortening

Witkowitz, in Hungary, a similar process is still successfully applied, where three furnaces are thus enabled to tap 17 charges in the 24 hours. It has been proposed that the first stage of this process be carried out in an ordinary Bessemer converter, from which the metal may be taken in a ladle or runner to the melting furnace with the metal-oids partially eliminated and the temperature considerably raised. The objections to this are obvious, and no product would fetch a price to justify the added cost.

The Pernot Furnace.—We are not aware whether direct metal has ever been applied to this furnace, though success might reasonably be expected in that instance, but even in melting down an ordinary pig and scrap charge its speed is greater than in the Siemens furnace. The motion causes a mechanical agitation of the bath which continually submits new particles to the chemical reactions, conducted at a lower temperature and with less expenditure of fuel than in an ordinary melting fur-

from a blowing engine passes through the axis and communicates by a short pipe with the blast box, entering the bath of metal through four holes. When it is thought that the blow has been continued long enough the hearth is revolved until the tap hole takes the position of the blowing nozzles, when the blast is shut off. The charge is then treated as an ordinary Siemens bath. The pig iron may be charged either molten or otherwise.

The Converter Furnace.—Like the Ponsard patent, we have here a combination of the Bessemer and Siemens processes, and apparently the only arrangement by which the advantages of both without the joint cost of each can be insured. The converter vessel is at the same time a complete Siemens furnace. The converter is mounted on two hollow trunnions lined with refractory material and communicating at their extremities with the gas and air ports of a set of reversing regenerators. It is revolved to the extremes shown dotted in the figures, by means of a



Figs. 18 and 19.—THE SMITH-CASSON FURNACE.

the period of charging is, of course, well known. The process of melting is hurried in several ways, either by charging the pig iron in a molten or red hot state, by the employment of a rotary hearth, or by partly desilicizing the molten metal in the bath by means of air blast. The practice of charging with molten pig has been tried over and over again, with doubtful success. The difficulty appears to lie in the coldness of the direct metal, which presents to the flame in the melting furnace a pasty and still bath of which only a small part, the surface, is exposed to the oxidizing effect. It therefore becomes extremely difficult to raise it to a higher temperature, and, unless the metal were continually worked and turned over, as it would be in the revolving hearth of a Pernot furnace, there appears to be no hope of success at the present moment. At Ruhrort, in Germany, a prolonged trial of a set of refractory air tuyeres, immersed for a time in the bath and blowing for a few minutes sufficient air to desilicize and partly decarburize the metal, at the same time raising its temperature, has shown that no advantage is derived. On the other hand, at

nace. Holley and others have made us familiar with the apparatus. The hearth is inclined at an angle of about 5° and revolves at the rate of two turns per minute, the weight being taken by four or more wheels treading a circular path. The hearth is mounted on a carriage by which it may be withdrawn for repairs from the body of the structure. The objections appear to be the difficulty of supporting and maintaining a roof that is necessarily independent of the walls of the hearth, in preventing the brick work at the junction of the roof and hearth from jamming or opening too wide, and in keeping down generally the maintenance cost. The dimensions of the St. Chamond 20 ton furnaces are: Diameter of hearth inside lining, 13 feet 9 inches; depth of hearth pan, $16\frac{1}{2}$ inches, valves, 33 inches; regenerator, 10 feet 2 inches by 3 feet 8 inches by 8 feet 6 inches; cubic contents of regenerators, 1280 feet.

The Ponsard Furnace.—This is an attempt to combine the advantages of both the Bessemer and Siemens process. The hearth is to all intents and purposes a Pernot hearth, revolving when required, on a hollow inclined axis which forms also the blast box. The regenerators do not reverse in the instance given in the figures. The blast

worm wheel and worm actuated by a vertical engine, and the blast communicates with it in all positions through a movable elbow or swivel pipe. The joints between the trunnions and the ports are made by an arrangement of angle and channel irons, the brick work face being kept true by a water cooled ring plate. Molten metal may be poured into the nose of the converter from a ladle on a high level stage, and the vessel turned up and blown the required period. To complete the bath as a Siemens charge the vessel lies on its side and the necessary additions and tests are made through its mouth, the door of which may be lifted. The finished metal is poured in the usual way into a center ladle, from which the ingots may be cast in a pit, and a bogie or sand pit may receive the slag.

Acting as an open hearth furnace, the ports are of simple form and provided with a repairing cover on top and slag pockets beneath. The regenerators are in couples, as explained by the drawings, and the reversing valves stand at the back of the apparatus. The form of the melting vessel is peculiarly adaptable to a basic lining, which may be effectually isolated from the silica brick work at the ports by means of the water plate mentioned.

* See *The Iron Age*, November 15, page 851; November 29, page 940, and December 13, page 1054.

The Acid Process.

The pig and ore process, without scrap, is not now largely resorted to. The relative prices of pig iron, scrap, ore and labor are of course the only determinates of the economic value of either process. The ore as compared with the scrap process has, therefore, no advantage or disadvantage in an abstract case, but if we conceive a district in which the pig iron and labor are cheap, and scrap dear, it may then become economical to adopt the pig and ore process. The two processes, conducted in a 20-ton furnace with a pig iron of the same character in each instance, show as follows:

	Pig and scrap.	Pig and ore.	Scrap and ore.
Charge, pig iron, lb.	8,624	33,936	31,276
Scrap, lb.	34,596		10,948
56 per cent. ore, lb.		8,848	5,712
Produce of ingots, lb.	41,016	33,834	43,648
Loss of Fe, per cent.	5.1	13	3.2
Time of operation, hours and minutes.	7-50	11-25	10-30

Fuel and labor may be estimated from the duration of the operation, being highest with the pure pig and ore process and lowest with the pig and scrap. It may be remarked that in the first column a very small proportion of ore was added. The lime and spiegel additions, which are not given, account for any discrepancy in the losses of metallic iron. In the third column, for comparison, is a charge embracing both scrap and ore.

It is this latter charge which is now most largely used, except in certain districts in Germany and France where the pig and scrap charge is found, the furnaces being really auxiliaries to Bessemer plant, and used to melt the scrap of basic Bessemer plants. The long time taken to complete the pig and ore bath is, except under the possible local conditions indicated above, a serious objection to the process. In the same way, there are few districts where scrap is so abundant that steel may be produced on a large scale by the scrap process. In this country and in England it has therefore become the practice to use both pig iron and what scrap is available. In that case the output is increased, the slag is less excessive and troublesome, and the cost of maintaining the furnace is reduced. This high cost of repairs in the pig and ore process is due partly to the prolonged character of the operation and partly to the higher temperature obtained and required.

In the pig and ore or purely Siemens process, No. 1 or No. 2 hematite iron is charged onto the bed of the furnace, and as soon as it is melted the first ore addition is made. The ore should contain 60 per cent. of metallic iron, be as pure as possible and of a lumpy character. Small ore gives trouble in the bath. The ore additions are continued from time to time, with an occasional lump of limestone to separate the iron in the slag. If the silicon in the pig iron is high the slag formed is thick and heavy and the oxidation and temperature of the bath are retarded; more ore and at more frequent intervals is then required. The total ore required depends altogether on the nature of the materials, the proportion varying from 15 to 20 per cent. of the weight of pig iron, and the whole time from charging to tapping is equal to that taken by between two and three scrap charges. The slag on the surface of the metal is considerable and is the chief reason of

the prolonged time necessary, but the heat obtained has a great advantage in securing a uniform metal that lies quiet in the molds and has no blow holes.

In the Siemens-Martin or scrap process, a preliminary bath of pig iron is prepared, to receive the scrap additions. This bath is absolutely necessary, as wrought iron or steel scrap cuts the hearth up and when melted oxidizes very rapidly. If the scrap added is small in character, such as plate or sheet shearings, it should be immersed in the bath in bundles immediately it is thrown in, as the oxidation is very rapid. Scrap of this character should always be compressed into bundles. Should it be of heavier character, it is advisable to charge in onto the bank or bridge of the furnace, and when at a good heat it may be turned in. The rate at which the additions may be made depends very much on the furnace and materials; the flame must be as nearly neutral as possible, and as regards the materials, the pig iron should be, for the best working, a fine gray No. 1, the steel scrap being of rail quality. Under such conditions the proportion of scrap will be from eight to ten times the weight of pig iron and the charge will take seven to eight hours from charging to tapping.

We have already endeavored to describe the process of burning in a silica bottom. The life of the furnace depends very much upon the care with which this is done, and it is an operation which should be carried out slowly, with many small successive additions of sand rather than few large additions. The silica sand should be the cleaner and purer pieces of quartz rock ground perfectly fine, as it is difficult to find a natural sand pure enough. The following stones are used in England for the manufacture of silica bricks and fettling sand:

	1.	2.	3.	4.	5.
Silica.....	98.10	94.13	95.22	96.93	93.30
Alumina.....	1.04	2.45	2.40	1.06	3.96
Oxide of iron	0.56	2.01	1.28	1.26	0.99
Lime.....	0.53	1.03	0.76	0.08	1.06
Magnesia.....	trace.	0.48	0.31	0.11	0.39

Nos. 1 to 4, inclusive, are Welsh stones and No. 5 is Scotch, all in successful use at various works. In each case the alkalies and combined water are under 0.5 per cent.

In making silica bricks it is a great mistake to crush the particles too fine. The stone is broken up in Marsden or Blake crushers and falls under the runners of a ganister mill, in which the addition of a fairly diluted lime wash is made, but the amount of lime added must not exceed 1 to 1½ per cent. of the silica, as anything beyond this only serves to flux the brick. The mixture should be molded immediately, and the manufacture necessarily entails a good deal of hand labor. The machines employed in Wales, where one of the finest stones in the world may be found, have two brass molds under each stamp, standing edgewise, and these are filled by hand, a comparatively small pressure being sufficient to mold the bricks. Until they are burnt they have little cohesion, and the base upon which they are molded must serve as the carrier for the drying floor boys, so that in removal they shall be handled as little as possible. What handling is necessary should be done always between two flat boards.

The white fettling sand derived from one of the above samples of quartz gives the following analysis: Silica, 96.22 per cent.; alumina and oxide of iron, 1.75 per cent.; lime and magnesia, traces; combined water, 2.05 per cent.

A new hearth should first of all be made to melt down a charge of melting

furnace cinder and mill or hammer scale, which soaks into the bottom and carries off the excess of loose silica sand and brick left in the furnace. The first charge should aim at a high carbon steel, say 0.50 per cent. of carbon, and after the third or fourth charge soft steel may be aimed for. The slag in the first two charges is absorbed by the brick work, and it will be found necessary to form an artificial slag by the addition of some melting cinder and clay bricks.

The furnace at this stage should give some indications of its speed and efficiency. When well hot the gas should burn clear and without cloud or smoke. If the ports give a proper admixture of gas and air the flame will have a neutral and not a severely oxidizing nature, a quality usually distinguished as a "cutting" flame. The draft across the furnace should be slow, and yet decided.

The chemistry of the elimination of the metalloids in an acid charge is a part of our subject with which we need not concern ourselves. It may be said in a general way that the carbon remains practically stationary until the bulk of the silicon and manganese has disappeared, and the sulphur and phosphorus are but slightly removed owing to the highly siliceous character of the slag. When the time comes for adding the ore and the bath is in a state of brisk ebullition, the boil should be kept as constant as possible with frequent small additions of ore. When a steel sample is obtained free from crystallization and honeycomb and apparently of the right ductility and hardness under the hammer, and when the appearance of the slag is equally satisfactory, the chemist should ascertain the carbon before the metal is tapped.

In order to follow closely the method of conducting the process, we give some examples from English works:

First Example.—This is a 15-ton furnace, which was charged with 17,920 pounds of No. 2 hematite pig iron and 13,440 pounds of steel scrap. Four hours later the charge was melted and the first and second samples, taken at an interval of half an hour, showed the following analyses:

1. Carbon, 1.38; silicon, 0.756; sulphur, 0.031; phosphorus, 0.060; manganese, 0.504.
2. Carbon, 1.38; silicon, 0.493; sulphur, 0.061; phosphorus, 0.060; manganese, 0.396.

Three additions each of about 370 pounds were then made at intervals of ten minutes, and the third half-hour sample taken:

3. Carbon, 1.35; silicon, 0.098; sulphur, 0.060; phosphorus, 0.059; manganese, 0.036.

Three further additions of ore, of equal weight and at the same intervals as the last, were made during the next half hour, when the fourth sample was taken:

4. Carbon, 1.09; silicon, 0.070; sulphur, 0.060; phosphorus, 0.060.

At this point 224 pounds of ore and 56 pounds of limestone were added on three occasions, and the next half-hour's sample showed:

5. Carbon, 0.93; silicon, 0.028; sulphur, 0.060; phosphorus, 0.060.

After a further 224 pounds of ore, in half an hour the sample had:

6. Carbon, 0.65; silicon, 0.018; sulphur, 0.060; phosphorus, 0.060, and the slag:

a. SiO₂, 55.66; Al₂O₃, 1.75; FeO, 29.58; CaO, 5.73; Mg, 6.54; S, 0.03; Mn, 0.76; Fe, 23.00.

224 pounds of ore and 56 pounds of limestone added:

7. Carbon, 0.53; silicon, 0.009; sulphur, 0.060; phosphorus, 0.060.

8. Carbon, 0.26; silicon, 0.007; sulphur, 0.06; phosphorus, 0.06.

- b. SiO₂, 52.07; Al₂O₃, 1.97; FeO, 32.50; CaO, 6.26; Mg, 6.22; S, 0.02; Mn, 1.06; Fe, 25.27.

- 168 pounds of ore and 56 pounds of slag added:

9. Carbon, 0.13; silicon, 0.005; sulphur, 0.06; phosphorus, 0.06.

c. SiO_2 , 53.39; Al_2O_3 , 2.03; FeO , 32.18; CaO , 6.19; Mg , 4.98; S , 0.02; Mn , 0.70; Fe , 25.00.

Fifteen minutes later the charge was tapped, 170 pounds of ferromanganese containing 80 per cent. manganese, 5 per cent. silicon and 6 per cent. carbon thrown into the ladle, and the ingots gave an average of:

10. Carbon, 0.13; silicon, 0.02; sulphur, 0.065; phosphorus, 0.065; manganese, 0.456.

The time occupied from the charging to tapping was 8 hours 20 minutes, and the total materials charged as follows:

	Pounds.
Pig iron.....	17,920
Steel scrap.....	13,440
Ferromanganese.....	170
Iron ore.....	4,450

and from this the total weight of ingots produced was 30,006 pounds.

b. SiO_2 , 55.60; FeO , 2.56; Fe_2O_3 , 24.26; MnO , 6.41; CaO , 8.43.

The charge consisted of:

	Pounds.
Pig iron.....	31,360
Steel scrap.....	13,440
Ferromanganese.....	404
Iron ore.....	8,512

The limestone required to keep the slag basic and molten was 644 pounds, and the ingots produced 33,460 pounds, the loss being high.

Third Example.—Analyses of metal and corresponding slag taken after the first addition of ore and at tapping time:

	Carbon.	Silicon.	Phosphorus.	Sulphur.	Manganese.
1.	2.19	0.09	0.043	0.02	0.19
2.	0.06	0.04	0.045	0.02	0.26

a. SiO_2 , 31.90; FeO , 51.30; Al_2O_3 , 6.39; CaO , 2.93; MgO , 2.45; MnO , 5.30.

The charge took 3 hours 40 minutes to melt and $1\frac{1}{2}$ hours to boil, and it was tapped 4 hours 20 minutes later.

Fifth Example.—This charge consisted of:

	Pounds.
Pig iron.....	35,924
Tin plate shearings.....	15,904
Ferromanganese.....	412

The analyses of the material charged and of the steel respectively were:

	Carbon.	Silicon.	Sulphur.	Manganese.
1.....	2.1	1.482	0.070	0.564
2.....	0.15	0.026	0.08	0.45

The additions made to the bath were:

	Pounds.
Iron ore.....	5,040
Limestone.....	80

The charge took 3 hours 15 minutes to work, and yielded 50,255 pounds of clean ingots.

Sixth Example.—The following is the result of one week's work of a 20-ton furnace:

	Tons.cwt.	Pounds per ton of ingots produced.
Pig iron.....	142 10	1,609.28
Tin plate shearings.....	61 17	698.48
Ferromanganese.....	1 7 $\frac{1}{4}$	15.67
Total.....	205 14 $\frac{3}{4}$	2,323.43
Ingots produced.....	198 7	2,240.00
Loss.....	7 7 $\frac{1}{4}$	83.43
Iron ore.....	32 11	367.59
Limestone.....	2 2	22.90

The Verner Annealing Furnace.

The furnace designed by Wm. J. Verner of New Castle, Pa., is intended for annealing sheets and plates of all kinds. It is so constructed, as will be

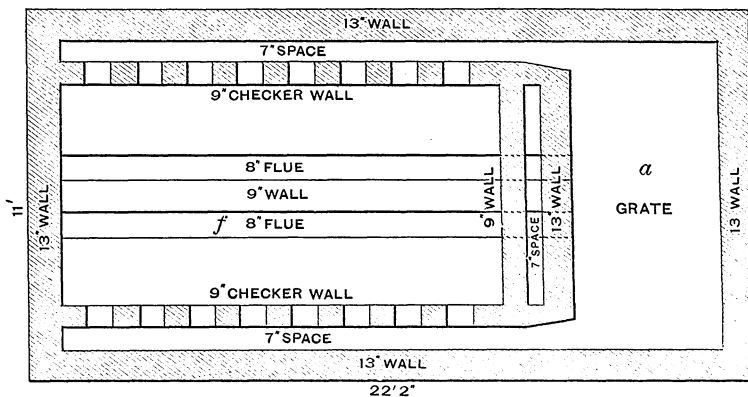


Fig. 1.—Sectional Plan.

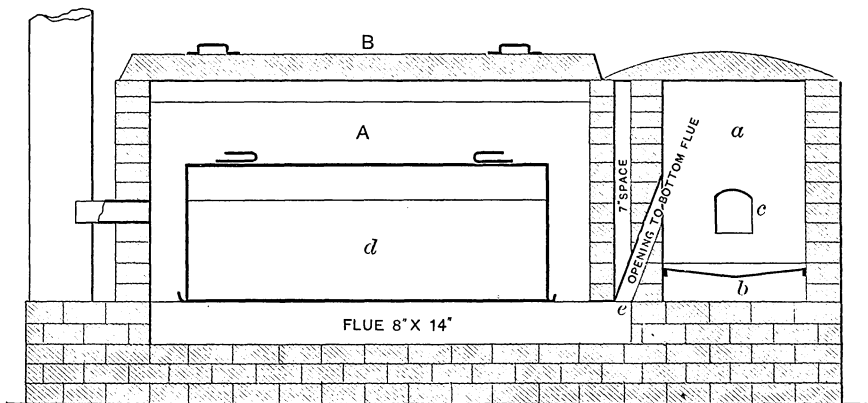


Fig. 2.—Vertical Sectional Elevation.

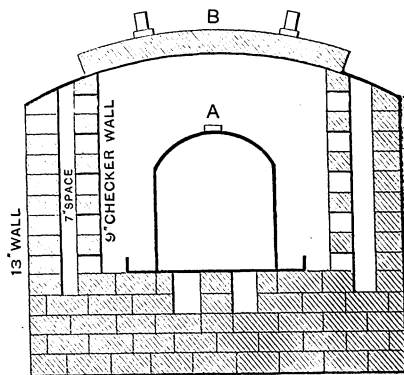


Fig. 3.—Cross Section.

THE VERNER ANNEALING FURNACE.

Second Example.—Thirty-one thousand three hundred and sixty pounds of pig iron and 13,440 pounds of steel scrap were charged into a 20-ton furnace, and samples of the metal were taken: 1, as charged; 2, when melted; 3, after addition of 4480 pounds of ore, and 4, after the boil was over:

	Graph.	Car.	Sil.	Sul.	Phos.	Mang.
1....	3.70	0.30	2.08	0.02	0.046	0.72
2....	nil.	1.755	1.35	0.02	0.046	0.396
3....	1.655	0.196	0.022	0.045	nil.	
4....	0.155	0.004	0.024	0.048	nil.	

As in the former instance the sulphur and phosphorus increased, being derived probably from the sulphur in the producer gas and the phosphorus in the ore. The finished steel had:

5. Combined carbon, 0.170; silicon, 0.004; sulphur, 0.023; phosphorus, 0.048; manganese, 0.346,

while the slag, upon the physical qualities of which the furnaceman depends a good deal, showed the following analysis:

a before and b after adding the manganese:

a. SiO_2 , 55.60; FeO , 8.88; Fe_2O_3 , 25.78; MnO , 4.25; CaO , 8.45.

b. SiO_2 , 50.15; FeO , 35.49; Al_2O_3 , 4.72; CaO , 2.93; MgO , 2.27; MnO , 4.25.

Of sulphur and phosphorus in the slag, there were only traces.

Fourth Example.—The average composition of this charge was: Carbon, 2.22; silicon, 1.219; sulphur, 0.074; manganese, 0.543; and it consisted of:

	Pounds.
Pig iron.....	15,680
Steel castings.....	2,240
Ingots.....	8,960
Ferromanganese.....	188

The additions made were:

	Pounds.
Iron ore.....	3,920
Limestone.....	30

The gas used had the following composition:

	In regenerators.	In chimneys.
Carbonic acid.....	4.5	10.2
Oxygen.....	0.4	0.6
Carbonic oxide.....	26.2	nil.
Hydrogen.....	11.5	nil.
Marsh gas.....	1.4	nil.
Nitrogen.....	56.0	89.2

understood from the drawings, that it can be charged and the charge removed without permitting it to cool, as is the case with the usual style of furnace. The charge is put in at the top, so that there is not the same opportunity for cooling as when the charging is done at the end. The equipment consists of a bottom weighing about 2600 pounds, with a wrought iron box, d, weighing about the same and which will hold about 10 tons of sheets, which can be annealed in 24 hours or less. The charge is inserted through the top, the cover B being removed. The course of the heat from the grate b, through the flues and checker walls, is made plain by the drawings. The heat is uniformly distributed in the furnace proper, A, as it enters from the bottom, sides and top. It is stated that the annealed sheets are softer, of a better color and are treated more uniformly than is possible with the ordinary furnace. One of these fur-

naces has been in successful operation at the Arethusa Works, New Castle, Pa., for some time and another is now being built.

San Francisco News.

The great cruiser "Olympia," the greatest ever built on the Pacific Coast, will soon be ready to do good work in the service of the country. The guns will soon be delivered at the Union Iron Works to allow the contractors to get her ready for active duty. It is two years since work was started on her and a year since she made her trial trip. It does look to the uninitiated a long time to take to get her guns ready and to bring them here, but it is no use criticising the operations of the Department. About the first of the year the guns will be on hand, and it will take about three weeks to complete the work of putting them in position. Her armament consists of ten 5 inch and four 8-inch guns. The "Olympia" is a protected cruiser with twin screws, triple expansion engines and a ram. She has two broadside torpedo tubes on each side. The vessel's displacement is 5500 tons. She will have a speed of 20 knots, and has 13,500 horse power. Her builders have received as premium for extra speed developed on her trial trip the sum of \$300,000. The vessel can turn a full circle in about seven minutes. She will probably use smokeless powder. She can carry sufficient coal to make a trip to Hong Kong without having to stop at Honolulu to recoal. She is one of the type that the Japanese are using so efficiently in their war with China. It is the opinion of our best citizens here that the Congress of the United States should start as soon as possible to build up a navy that will make the country respected in war as well as in peace, and if this policy should prevail San Francisco is one of the most fitting places in the country to help build up such a navy. It has been demonstrated that we can build the best steel ships in the world, and we have not only one but two yards where this can be done—for the success of the Union Iron Works has given rise to emulation among other gentlemen engaged in our iron industries.

The rains have come in abundance. We have had now an almost continuous storm for three days, and it looks as if improvements for the year were about over. Business is accordingly beginning to slack off, though not as much as might be expected. The latter half of 1894 has been much better for trade than the same time in 1893. For the balance of the year we expect that the principal business of our hardware and iron people will be the preparation of the yearly balance sheet. The rains which come to interrupt the current of trade, come also to tell all concerned of bountiful crops, and a good outlook for the coming year. And lower freights and light stocks will enable our merchants to meet it, and mayhap to extend their territory a little. Of course, there are a good many things that are in the nature of drawbacks, the principal being the low prices of wheat and the results of the tariff agitation, but merchants in general are prone to take an optimistic view of things at present.

In the matters of tin and tin plate, the latter especially, the market is firm. Pig tin is in very fair stock and sells at 16½ cents—at least that is the figure at which it is now quoted. But owing to the small imports of tin plate for the year

to date stocks in first hands are very light, the lightest probably in a score of years, and the market has improved a little. Coke tin, the description principally used here, is held at \$4 75 and is very firm at that. The stocks in first hands do not exceed 20,000 boxes, and it is known that there are not any large consignments afloat. But that is something that will make itself better manifest by and by. The stocks here given do not, of course, include those in the hands of cannery, but these are not supposed to be large. The fact is that with one of the lightest years of importation for a long time, the consumption was one of the largest on record, and I have no doubt that the consumption of 1895 will also be phenomenally large. I am led to this conclusion from the fact that the pack of Alaska salmon increases in volume every year, while our canned goods packers put up more and more fruits, no matter how strongly they assert that the coming pack is going to be cut down. The total imports of tin plate for the year to date have been 124,648 boxes. The total tin imports of the year to date have been 14,058 ingots. There has been quite a reduction in lead, shot, &c., which is now lower than ever before on this coast, pig lead being down to 3¼ cents per pound.

The imports of iron, steel, hardware, &c., by rail and sea, the former especially, continue to be large. For the week just ended they reached 51 carloads. The imports of pig iron by rail have fallen off, but there have been some considerable arrivals by sea of late. The "Kenilworth" had 520 tons of American pig, making a total of 5730 tons of American to date for the year by sea.

Tom Mann, in the course of an interview with a representative of the *Daily Graphic*, said the English trade unions are feeling the financial strain of the present state of trade most severely. The Amalgamated Society of Engineers, with 75,000 members, has steadily declined in wealth since 1890, and its funds now represent only \$12.50 per member. It is spending \$22,000 a week in benefits and there are 1300 members tramping the country for work.

Twenty manufacturers of threshing machines were represented in a meeting held at the Grand Pacific Hotel, Chicago, on the 12th inst., and proposed legislation on matters of importance to the trade was discussed. E. C. Nichols of Battle Creek was made president, and W. H. Haggard of La Porte, Ind., secretary. Those present were F. A. Peavey, Port Huron, Mich.; E. C. Mervin, Massillon, Ohio; J. M. Arbuckle, Toledo; N. W. Tully and S. E. Barlow, Marion, Ohio; B. M. Hutchinson, Columbus, Ind.; H. C. Fogle, Stillwater, Minn.; William A. Lynch and J. A. Linville, Canton, Ohio; J. B. Cartmell, Springfield, Ohio; W. N. Rumely, La Porte, Ind.; E. B. Mosher, Auburn, N. Y.; J. S. McDonald, Minneapolis; F. C. Davis, Davenport, Iowa; B. T. Skinner, Battle Creek, Mich.; F. K. Bull and C. H. Lee, Racine; John J. Hopkins, Marion, Ohio; Hugh W. Harrison, Belleville; A. A. McKain, Indianapolis; W. J. Robie, Richmond, Ind.; C. M. Avery, Peoria; B. Timmerman, Auburn, N. Y. The trade is considerably exercised over threatened State legislation with reference to the laws governing chattel mortgages, which, it is believed, will work disastrously to the interests of the manu-

facturers. A desire to prevent such legislation was the cause of the meeting.

The Walrand Steel Process as Applied to Cast Steel Horse-shoes.—A process of casting horse-shoes out of steel was patented some time ago by James Vernon, Glasgow, Scotland, and a demonstration of the results obtained was given recently. The apparatus consists of a steel mold in which the shoe is cast vertically. This mold is in two parts, the top of the shoe being molded in one part, and the bottom in the other. The mold is so arranged that the face (in which one-half of the shoe is molded) can be moved forward by a lever directly the shoe is cast, and so relieve this face of the shoe. By another lever the shoe itself is pushed out of the other half of the mold instantly, so that the shoe is perfectly free almost as soon as cast. A similar lever arrangement pushes forward two cutters, which cut off the "heads" the instant the pouring is completed, and another lever pushes forward a set of punches, and punches the nail holes the moment before the shoe is released. The whole of the operations only occupy a few seconds, and the shoes come out very perfect, scarcely requiring any trimming whatever. The steel used is produced by the Walrand-Legenisiel modification of the Bessemer process, in which ferrosilicon is added to the converter after the ordinary blow is finished. The converter is then turned up and blown again for a short time, during which the silicon is burnt out, and a very high temperature developed, giving great fluidity to the metal. Very small charges can be blown in this way, the converter used by Mr. Vernon taking only 4 hundredweight. The steel making has been superintended by George Snelus and his son.

The Philadelphia City Council has approved the bill for the proposed new bridge of the Pennsylvania Railroad Company over the Delaware River. The approach on the Pennsylvania side will begin at Frankford Junction on the New York division of the Pennsylvania Railroad, and will connect with the Camden & Amboy Railroad at Fish House Station on the New Jersey side. The bridge will be 1950 feet in length, and will have a double track line of railroad, to be built at a clear height of 50 feet above high water. The width will be 84 feet over all. It will be constructed of steel and will be supported by six piers of masonry, rising 50 feet above the water. The bridge will have three fixed spans 540 feet in length and a draw span of 330 feet over all, providing for two clear openings of 125 feet each at the channel of the river. The piers under the fixed spans will be built of granite, 67 feet long and 21 feet wide, standing 45 feet in height above high water. The approach of the bridge on the Pennsylvania side of the river will be 2 miles in length and on the New Jersey side ¼ mile in length.

The American Institute of Mining Engineers will probably hold its next meeting in Florida, beginning its first session at Jacksonville or Ocala on March 26. Visits will be paid to the leading typical phosphate mines and to points of interest, including Tampa Bay, Punta Gorda, St. Augustine, the Indian River and Lake Worth. The tour in Florida will take about two weeks.

Fall Meeting of the Alabama Scientific and Industrial Society.

The fall meeting of the Alabama Scientific and Industrial Society was held on December 14 at the offices of the Tennessee Coal, Iron & Railroad Company, at Birmingham, Ala. A large attendance and a number of papers on scientific and practical topics made the meeting a very enjoyable and profitable one. President W. B. Phillips called the meeting to order at 7.30 p.m., and made a short address. The first paper read was by Prof. M. C. Wilson of Florence, Ala., on the sphathite ore and iron, made at Florence by the Spathite Iron Company. Analyses of the ore were given, which indicated about 22 per cent. of iron, 24 per cent. of lime and 21 per cent. of carbonic acid, with a very high percentage of phosphorus, over 1 per cent. in some cases. The iron made from a mixture of this ore and ordinary brown ores was high in graphitic carbon, even in low grade irons, and was very high in phosphorus, 1.60 per cent. and over. Silicon was below 2 per cent. It was stated that this iron gave remarkable fluidity to castings, and showed very light shrinkage, and that from 50 cents to \$1 above regular market prices was readily obtained for it.

In the discussion on the subject it was suggested that the ore could hardly be a carbonate of iron, as the carbonic acid was just about equivalent to the lime to form carbonate of lime; and, further, that the iron was present in a ferrous state, indicating sesquioxide of iron. The ore is brown in appearance, having no similarity to the Birmingham hard ore, which is red, though Dr. E. A. Smith, State Geologist of Alabama, stated that it appeared to belong to the Clinton formation, the same to which the Birmingham red ores belong. The similarity in analysis and results between these irons and the famous Jackson County, Ohio, silvery irons was commented on by C. A. Meissner, who attributed the results obtained mainly to the high phosphorus, which gave such great fluidity to the metal. The ore, however, is not similar to the Jackson County ores, which are mainly carbonates of iron and kidney ores, high in phosphorus.

C. A. Meissner of Birmingham then read some collected notes on cyanides found in the blast furnace. Very little has been written on this subject and but few data could be collected. It was shown that they are formed from the blast passing over white hot coke, producing a mixture of carbonic oxide and nitrogen, and this mixture passing over the alkaline carbonates contained in the burden in presence of carbon, forms cyanides of potash or soda, which latter are again decomposed higher in the furnace by steam, producing ammonia. An experiment made by G. Hilgenstock was quoted, of leading the gases escaping through the cinder notch after casting through an iron pipe into water, which became alkaline at once, and was found to contain mainly cyanide of potash and carbonate of potash, and on evaporating evolved large quantities of ammonia. Very hot working of the furnace assists in the formation of cyanides, which are carried upward and decomposed in toammonia, and escape as such in the gases. Prof. Ledebur states that in some cases as much as 15 grams of cyanogen and 29 grams of potash and soda were found in 1 c. m. of gas. Charcoal furnaces show larger formations of cyanides, owing to the

large amounts of potash and soda in the ash. When cyanides are decomposed they exert a strong reducing action on the ores and act as carbonizers to the iron, and thus play an important part in the reactions of the blast furnace.

In the discussion mention was made of the excessive amount of cyanides found in the North Birmingham furnaces of the Sloss Iron & Steel Company. J. H. McCune stated that the tuyeres were frequently more than half filled with semi-liquid cyanides, which evolved heavy fumes when allowed to run out; that the furnace blow pipes and tuyeres had to be cleaned very frequently after casts, involving stoppage and delay. He thought that the shape of the furnace might have some influence on the formation of cyanides, as the city furnace of this company, using practically the same raw materials, did not show but very little cyanide formation. He called on E. A. Uhling to state why North Birmingham furnaces should suffer more than the city furnace in this respect. Mr. Uhling stated that this was probably in part due to the practice at North Birmingham of drawing the gases after casting back into the stoves, as they did not readily escape through the furnace and clear the tuyeres. This would tend to collect the cyanides at the tuyeres at the very time that their formation was greatest—i. e., after casting. It had also been stated by Mr. Means, superintendent of the North Birmingham furnaces, that, in his opinion and observation these cyanides had a tendency to cut his tuyeres; that they frequently showed a distinct copper color, as though some action on the copper had taken place; that they lost many tuyeres when they could account for it in no other way. Prof. W. B. Phillips had read of cyanide of iron, that it was liquid when hot and dissolved completely in water, but could not say what action it had on copper, and whether it would cut the tuyeres. C. A. Meissner suggested pointing the tuyeres more downward, as their present upward pointed position facilitated the accumulation of cyanides, and this having been done seemed to relieve the trouble materially. No analysis having been made, it was difficult to get at further facts, and the matter was left for further investigation for the next meeting.

Prof. W. B. Phillips read a paper on flue dust collected at the Tennessee Coal, Iron & Railroad Company's furnaces and separated by magnetic separation. He gave a number of analyses, indicating sufficient iron, carbon and lime to make it appear worth while to try and save some of the material. He called attention to the peculiar fact that it contained considerable metallic iron, which could not all have come from the bell, mechanically swept off by the ores, &c., when charged. He also called attention to the fact that when pouring acid on this material, the same peculiar, disagreeable odor was noticed as when treating cast iron with acid, indicating the presence of hydrocarbons. The extreme fineness of this material was also commented on, 32 per cent. passing through an 80-mesh sieve, and 13 per cent. through a 100 mesh sieve.

In the discussion as to the practicability of saving this material, C. A. Meissner told of some experiments made by him of mixing this material with coal tar and pressing it into bricks, and E. A. Uhling mentioned some tests made by him of this material

which showed so high a percentage of iron (over 50 per cent.) as to cause him to haul it all in one pile with a view to utilizing it, but there it still lay, nothing having been done with it. The discussion brought out the fact that there was not enough of it made at one plant to warrant the erection of a plant large enough to handle the material economically, and that it would probably not pay to ship it from other furnaces to a central plant, owing to cost of freights, &c.

E. Ramsey, chief engineer of the Tennessee Coal, Iron & Railroad Company, discussed the saving of coke breeze now lost at the ovens of the district. He stated the ratio of loss to be about 4 tons out of every 200 tons coke made, and that it has been proposed to crush and mix this breeze with the coal to be coked, but so far no arrangement had been made to do this.

The discussion brought out the fact that this coke breeze was a most excellent fuel for heating stoves, giving results similar to anthracite coal and cleaner to handle; that efforts should be made to put it on the market for this purpose, and that \$2.25 per ton ought to be obtained for it; that it would be a simple matter to wash and clean it in a trough of running water, in front of the coke ovens, which would take out the brick dirt and clay mixed with it.

Mr. Ramsey, upon request, next discussed his new coal washer and a new screen put in at Pratt mines to screen the coal more thoroughly and prevent the larger lumps from carrying mechanically a portion of fine coal over the screens in their rapid descent. The screens are corrugated slightly and perforated, the upper screen with 3-inch holes, the lower with 1-inch holes. The form of the screen is curved, being almost horizontal at the upper end and curving down rapidly. The corrugations run across the screen, and by this way the motion imparted to the coal, by the rocking of these screens, is an accelerating one. The result is that the lumps separate as they slide down and allow the fine coal to drop through, and the corrugations allow the larger lumps to slide over them, while the smaller matter is caught and given more time to pass through the orifices provided for that purpose. The screens rock in opposite directions with about a 5-inch motion, thus preventing the rocking of the trestling that supports them.

Prof. E. A. Smith of Tuscaloosa, State Geologist, closed the evening's discussion by presenting and explaining his recently completed geological map and chart of the State of Alabama, giving a very interesting and lucid description of the geological formations in this State, and showing the large amount of painstaking labor expended on this work by the Alabama Geological Survey.

Discussion developed the inestimable value of this work to the State, and that the Legislature should be implored by all interested in the industrial development of the State to not only continue this work but to increase its scope of usefulness.

The members then decided that the next meeting in the spring shall be devoted to the discussion of by-product coke ovens, and the following assignments of papers were made: Col. J. A. Montgomery, the Simon-Carves oven; C. A. Meissner, the Otto-Hoffman oven; J. D. Hillhouse, the Semet Solvay oven; E. A. Uhling, furnace effects and conditions as affected by or affect-

ing by-product coke; Prof. W. B. Phillips, scientific results and values of by-products; Prof. E. A. Smith, benzoles obtained from by-products, their application and value in the arts and from a commercial standpoint. This will make the spring meeting one of unusual interest and importance to the members.

The meeting was then adjourned after a visit to the new laboratory of the Tennessee Coal, Iron & Railroad Company, under charge of Prof. W. B. Phillips. It is equipped with the most modern apparatus for rapid and accurate work. His progressiveness is especially worthy of remark and comment, as comparatively little attention has heretofore been paid to the scientific departments of our iron companies, and this laboratory and its equipment is an indication of a spirit highly commendable to the officers of the Tennessee Coal, Iron & Railroad Company.

The War Department Board, consisting of Brigadier General Casey and Colonel Craighill of the Army Engineer Corps; Captain Dewey of the Navy; Mendez Cohen of Maryland, and E. Porter Alexander of South Carolina, which has been considering the most feasible route for the Chesapeake and Delaware Ship Canal, has reported in favor of the Black Creek route, which is substantially located upon the line of the existing canal connecting Chesapeake and Delaware bays. The canal as recommended will have a length, measured from the port of Baltimore to a point at sea 12 miles outside of Delaware Breakwater, of 150.13 miles, the canal proper being 13.63 miles long, and it is estimated that it will cost \$7,600,000 to secure a depth throughout of 27 feet.

The Pittsburgh *Dispatch* takes a hopeful view of the existing industrial situation in that city and district. A recent editorial sums up their present position as follows: "Increasing activity is noticeable in the Pittsburgh mills, and Christmas will have a much brighter aspect for the working classes than last year. Many plants are working full double turn, and all the mills which have worked any during the year are now running. Orders are reported numerous at the prices which have generally prevailed for several weeks."

Bureau Bros., bronze founders, Twenty-first street and Allegheny avenue, Philadelphia, are at work on a handsome pair of solid bronze vault doors and other work for the George W. Childs mausoleum now in course of erection in Laurel Hill Cemetery, Philadelphia. The doors are each 7 feet high and 3 feet 3 inches in width, and will be surmounted by a molded cornice of elaborate workmanship. Each door will be ornamented with an oblong grille of exquisite design in scroll work. The firm have just completed a bronze statue of William Penn, one of three figures that are to surmount the new Betz Building, in Philadelphia.

Fresh discoveries of lead ore in the interior of the State of Missouri are attracting lively attention in Western mining circles. The uprooting during a recent storm of a large tree on a farm in Washington County is reported to have disclosed a heavy lead deposit at its root. Some 400,000 pounds of the

mineral have been dug and sold, and preparations are being made to work extensively in the vein thus struck.

Trade Publications.

THE METROPOLITAN FIRE PROOFING COMPANY of Trenton, N. J., have issued an elaborately illustrated catalogue describing their system of fire proofing. Fire proof floors are made in the following manner: Cables, each composed of two galvanized wires, twisted, are placed at given distances apart over the tops of the beams and transversely with them. These cables pass under bars in the center of the spans and are thus given a uniform deflection between each pair of beams. The distance between the cables is varied with the loads to be provided for. Forms or centers are then placed under them and a composition, made principally of plaster of Paris and wood chips, is poured on. This composition solidifies in a few minutes, after which the forms are removed. The resulting floor is sufficiently strong to be used at once under the loads for which it has been calculated, and as its surface is uniform and level with the tops of the beams, a working floor is thus furnished. This is of great advantage in facilitating the general construction of buildings. In cases where a flat ceiling is not required the under side of the floor plate furnishes a ceiling surface ready for plastering. The lower portions of the beams, projecting as they do below the floor plates, are protected with a covering of the composition cast in place. Imbedded in this is wire netting passing under each beam and attached to the cables which carry the floor plates. From the foregoing it will be evident that this system can be arranged to suit almost any construction. The fire proofing of beams, which the material effects with certainty, is one of the essential advantages of the system. A material may itself be sufficiently fire proof but at the same time be such a conductor of heat as to be useless as a protection from its effects. The composition used in this system is, on the other hand, so remarkable a non-conductor of heat that a moderate thickness of it prevents the passage of nearly all warmth. In severe fire tests the beams have remained cold and consequently were unaffected, while in some cases beams covered with tile or brick arches have been so affected by heat as to deflect and allow the arches to fall before the flame reached them. When exposed to flame for a long time the Metropolitan composition is attacked to a depth of from $\frac{3}{16}$ to $\frac{1}{2}$ inch, the remainder being unaffected, and when water is thrown upon it the mass does not crack or fly.

CATALOGUE No. 19, just issued by the Dean Bros. Steam Pump Works, of Indianapolis, Ind., describes the steam pumping machinery built by them. Among the pumps described and illustrated are boiler feed and fire pumps, double plunger pumps, combined boilers and pumps, air pumps, geared power pumps, natural gas pumps, blowing engine and air compressors, vacuum pumps, condensers, compound duplex steam pumps, &c. The engravings and drawings presented show clearly the principal features of each type.

The Treasury report of the foreign commerce of the United States to November 30 last shows an excess in the values of exported merchandise during the 11 months of this year over that imported just twice as great as that shown for the same period of last year, the figures being \$130,000,000 and \$65,000,000 respectively. The total exports of goods for the 11 months are given as \$700,200,000 as compared with \$783,200,000 in 1893; and the imports as \$610,200,000, compared with \$717,100,000 for the first 11 months of last year. November's imports show a slight increase over those of November, 1893.

Claus Spreckels, the sugar king, drew a check a few days ago for \$1,500,000 on the Nevada Bank in pay-

ment for 40,000 acres of land in Southern California, on which is located the Chino sugar factory. The deal included the town site of Chino, the Chino Valley Railroad and other valuable property.

John McBride of Columbus, Ohio, who has been brought into prominence during the recent miners' strikes in his capacity as president of the United Mine Workers, was on Monday elected president of the American Federation of Labor, defeating Samuel Gompers of New York, who for many years has held that position. The election of McBride is regarded as a triumph of the socialist and radical trades unionist elements in the Federation, who are discontented with Mr. Gompers' conservative attitude during the Chicago labor troubles last summer.

Much valuable information regarding the behavior of ships, guns and armor is looked for by naval men from the results of the recent fighting in the far East. It is stated by *Engineering* of London, on what appears to be reliable authority, that the fate of the Chinese ironclad "Ping Yuen" was decided by one round from a Canet 12.60 inch gun, the heaviest weapon in both fleets. The shell which sunk the unlucky ironclad was a Holtzer projectile, weighing about 1000 pounds. It crashed through the after part of the vessel's armored flank, the ship sinking by the stern almost immediately.

The Naval Bureaus of Steam Engineering and Construction are said to be at loggerheads in regard to the defective ventilation in the fire rooms of the cruisers "Raleigh" and "Cincinnati." The two bureaus have diametrically opposite views as to remedying the defect. The Bureau of Steam Engineering wants the blowers removed and that of Construction insists that they shall remain. A board is to be appointed to arbitrate in the case.

A well authenticated rumor is current in labor circles to the effect that the organization known as the Knights of Labor is on the point of dissolution, and that the majority of its present membership, estimated at 60 per cent., are about to throw in their lots with the Federation of Labor. The eccentric vagaries of Sovereign, the present General Master Workman of the Knights, are said to have brought the order into disrepute and unpopularity.

Articles of incorporation have been filed at Seattle, Wash., for the Seattle Copper Company.

The Cleveland *Plain Dealer* states that the iron ore and coal docks of that city have an aggregate daily handling capacity of 38,000 tons, and a storage capacity for iron ore of 1,900,000 tons, but this is inadequate to the growing demands of its commerce, and relief in the near future must come through the extension of the railroad terminals into the outer harbor.

The American Federation of Labor, in convention at Denver, Col., has rejected by a vote of 1173 to 735 the political platform proposed by President Gompers. A resolution was adopted for the removal of the headquarters of the Federation from New York.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., December 18, 1894.

The most important test of rapid fire guns ever undertaken under the auspices of the Ordnance Department and the Board of Ordnance and Fortifications has now fairly commenced at Sandy Hook.

The guns being tested are 4.72 inches and of larger caliber than any rapid fire gun in use in the United States Army. All the guns being tested are of foreign make and are four in number—viz., the Hotchkiss, an American invention manufactured in France; the Canet, French; the Schneider, French, and the Armstrong, English. The following is the official programme under which the test of 4.72-inch rapid fire guns is being made:

The board is directed to examine the parts of the breech mechanism, strength, simplicity, certainty of action, &c., especially the action of the firing pin and extractor and the maximum outward position of the cartridge when it can be pushed home by the breech block. During this examination 20 rounds to be fired at will.

The following is the test for each gun: Velocity, five rounds with full charges. Accuracy, ten rounds at 1 mile and 3000 yards. Rapidity, number of rounds fired in three minutes, and condition of the gun as to heat and ease and certainty of action. Rapidity with accuracy, fire ten aimed shots as rapidly as possible at 1000 yards and 1-mile targets; ten aimed shots at 500 and 1000 yards alternately; ten aimed shots alternately at targets about 500 yards range and 75 feet apart. Test of shrapnel against steel plates, two shrapnel of each kind to be fitted with Frankford Arsenal sensitive point fuses and fired to burst while passing through a screen placed in front of a 1½-inch rolled steel plate 150 feet from the gun; effect on the plate of the fragments to be noted; charges to give muzzle velocity equal to the remaining velocity at 1 mile when full charges are used. For dispersion, three shrapnel of each kind to be fitted with fuses, as above, and to burst while passing through a screen about 100 feet in front of the 1000-yard target; the number of hits and their character as regards penetration, &c., to be observed. Canister, two canister of each kind to be fired against a 1½-inch rolled steel plate 300 yards from gun; effect on plate to be noted. Also two canister of each kind to be fired against a screen 26 x 20 feet and 100 yards from gun; number of hits at each round to be noted. Rapidity with accuracy against a moving target, a boat on which is placed a suitable target to be towed across the line of fire at 6 miles an hour; while within range of 500 to 2000 yards each gun to be fired with aimed shots as rapidly as possible for three minutes; number of hits to be noted. Dust, mechanism of each gun to be exposed to blasts of fine dust, after which 20 rounds to be fired as rapidly as possible. Rust, five rounds to be fired after mechanism is rusted. Excessive charges, each gun to be fired five charges with gradually increasing pressure, the maximum about 33½ per cent. above service pressure. Defective cartridges, each gun to be tested with defective cartridges, same as for small arms. Endurance, guns passing these tests to be fired 100 rounds for endurance, during which the gen-

eral efficiency of the gun, its mount, regularity of action of the fuses to be observed. Any gun showing marked inferiority as compared with others to be suspended. A report of the progress of the test from the board shows 51 rounds fired December 15, 1894.

It will be some time before the complete series under the programme laid down by the Department will have been completed. The report will also be of much scientific importance in this branch of ordnance manufacture, as American inventors have not yet advanced to that degree of application of the rapid fire system.

In the test of the Carnegie 17 inch Harveyed steel armor plate, representing the barbette of the "Oregon," a 10-inch projectile being used, at the first shot the projectile penetrated 16 inches and rebounded complete. The second shot penetrated 12 inches and broke into fragments. There appears to be some question as to whether this plate passed the requirements of acceptance. The official report will not reach the Ordnance Bureau for several days.

Under the proposals submitted a short time ago to the Ordnance Department of the army for disappearing 10 inch gun carriages, the following awards will be made: For ten carriages to the Kilby Mfg. Company of Cleveland, Ohio, for \$12,350 each. For five carriages to Cramp & Sons, Philadelphia, \$17,500 each. For five carriages to the Pond Machine Tool Company, Plainfield, N. J., for \$16,875 each.

THE WEEK.

A new and formidable competitor to the Standard Oil Company has arisen in Ohio by the combination of three of the largest independent oil corporations of that State. Two others are also expected to be added to the new combine. The deal, which involves between \$6,000,000 and \$3,000,000, was consummated last week. The new combination will refine by the Berg process, which, it is claimed, removes the sulphur from the Ohio oil, making it superior to the Pennsylvania product.

Surveys are being made for the line of a new railroad to be constructed from Santa Fé, near Guthrie, Oklahoma Territory, east through the timber and coal regions of the Indian Territory, to Fort Smith, Ark., with the idea of eventually extending the road to Memphis on the East and Albuquerque on the West. The backers of the scheme are said to be financially strong.

A new coal and coke company have recently been organized at Charleston, West Va., with a capital of \$1,000,000, to control the output of coal and coke in the Kanawha and New River coal fields.

The new United States torpedo boat "Ericsson" is a most unfortunate boat in regard to her trials, a series of accidents having caused them to be postponed time and again. The latest attempt, made two weeks ago, resulted in another break-down. The trial trip of the craft will now be postponed until the spring.

An electrical deal of some magnitude was consummated last week in Philadelphia, by which the Electric Storage Battery Company of that city virtually obtain control of all their former competitors in the business of supplying

storage batteries and put an end to all litigation over patent rights. The Electric Storage Company, who will have a paid-up capital of \$500,000, have acquired all the battery patents and rights of the Consolidated Electric Storage Company, the Brush Electric Company of Cleveland, the General Electric Company, the General Electric Launch Company, the Electric Launch and Navigation Company, and the Accumulator Company.

The estimates of appropriation required for the service of the fiscal year ending June 30, 1896, sent to Congress by the Secretary of the Treasury, aggregate \$410,435,079, as against \$411,879,041, estimated for the current fiscal year. The following table exhibits the estimates for the various departments for 1895-1896, together with those for the present fiscal year:

Departments.	Estimates for 1896.	Appropriations for 1895.
Legislative.....	\$8,336,742	\$10,377,617
Executive.....	139,540	194,024
State.....	1,780,538	2,008,218
Treasury.....	138,487,281	133,735,362
War.....	54,855,629	55,296,820
Navy.....	31,999,886	26,726,752
Interior.....	158,929,873	173,825,971
Post Office.....	6,532,826	2,468,982
Agriculture.....	2,400,330	3,227,262
Labor.....	187,470	170,011
Justice.....	6,724,960	7,730,399
Grand totals...	\$410,435,079	\$415,780,943

Late statistics place the number of incandescent lamps in the United States at 4,000,000, about 2,500,000 being in central station plants and 1,500,000 in isolated plants.

Estimates for river and harbor improvements under the War Department in the fiscal year ending June 30, 1896, include \$500,000 for improving the Hudson River and \$1,000,000 for improving the harbor between Philadelphia and Camden, N. J.

Mexican Custom House returns show that the exports of coffee from the Republic during the fiscal year just closed were 7,500,000 pounds, the major part of which went to the United States. A large proportion of the present season's abundant coffee crop is said to be in danger of being lost through the lack of labor in certain districts.

It is current report in New York that a suit will be begun in the United States Courts against the National Lead Company for the recovery of some \$25,000, alleged to have been unlawfully obtained from the Government in drawbacks upon exports of pig lead. Charges to this effect were made last winter by a discharged employee of the Lead Company and the affair was investigated by the Treasury Department. Colonel Thompson, the president of the company, says, however, that the Treasury Department had already exonerated the company and that no papers in a suit had been served.

The latest report of the Director of the United States Mint places the world's gold production for the calendar year at \$170,000,000. This estimate, however, is a very conservative one, and Director Preston is of the opinion that the figures are likely to be considerably larger when the official returns are issued. Reports from the special Treasury agents point to the conclusion that there will be an increase of not less than \$7,000,000 in the domestic product over that of last year, which was \$35,955,000. The total production throughout the world in 1893 was \$157,000,000. The estimated increase in the production of the precious metal, outside of the United States, is \$10,000,000; in South Africa, \$3,000,000.

The Iron Age

New York, Thursday, December 20, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Fraudulent Shipments.

One feature of the Patterson bill for the amendment of the Interstate Commerce Law has escaped the general attention among business men which it deserves, because the provisions permitting pooling were seized upon as far reaching. The particular amendment alluded to reads as follows:

SECTION 10.—That any person, and any officer or agent of any corporation or company, and any member of any firm or partnership, who shall deliver property for transportation to any common carrier, subject to the provisions of this act, or any person, corporation, company, firm or partnership for whom as consignor or consignee any such carrier shall transport property, who shall, knowingly and willfully, by false billing, false classification, false weighing, false report of weight, false representation of the contents of any package, or by any other misrepresentation, deceit or device, obtain or seek to obtain transportation for such property at less than the regular rates then established and in force on the line of transportation of such carrier, shall be deemed guilty of a fraud, which is hereby declared to be a misdemeanor, and shall, upon conviction thereof in any court of the United States of competent jurisdiction within the district in which such offense was committed, be subject for each offense to a fine of not more than \$5000.

The framers of this amendment aimed at a very serious abuse. The representative in charge of the bill, Mr. Patterson, made the statement that statistics show that in transporting freight from the cities of New York, Boston, Philadelphia and Baltimore alone to the city of Chicago, there were in a single year as many as 173,000 instances of false shipment. Mr. Patterson does not give his authority for this stupendous figure, nor does he indicate in what manner his statistician conducted his investigation. In the absence of data on these points the figures will be received with reserve. Still it is the general impression among business men that frauds of this character are widespread, and that they are not alone connived at by the railroads, but are actually instigated in some cases. The fierce competition among the carriers has encouraged the practice and has made it impossible to bring false shippers to justice. The railroads have not dared to prosecute them, because they were afraid of losing the business. It is argued that if pooling be allowed, under proper restrictions and under fair supervision, the railroads would soon learn to put a stop to the practices referred to. It would not take many convictions to purify our industries and our commerce of this crying evil, and probably many of those who have been forced

into the system of underbilling, or of false classification, would be the first to applaud when it is abolished. Every honest merchant and manufacturer will be content when he is able to feel sure that no rival is undermining his trade because he is successfully cheating the railroads or is in collusion with them.

The Decision in the Debs Case.

Law is based upon common sense. Especially is this statement applicable wherever personal relations are involved. A Western judge of high standing and many years' experience on the bench was once asked by a young practitioner how the business of the courts was conducted in early days, when law libraries were few and it was often necessary in backwoods court houses to make decisions of knotty cases without the opportunity of consulting the authorities. The judge replied that it was then customary to get the best lawyers together who were in attendance upon the court, and their opinions were heard simply upon the plain point of a common sense settlement of the question at issue. It was almost invariably found, when an opportunity afterward existed to look up decisions in parallel cases, that a correct conclusion had been reached. This appears to us to be the true test to apply to the decision rendered at Chicago last week in the Debs case by Judge Woods of the United States Court. Mr. Debs and his associates had succeeded in paralyzing the vast railroad business centering at Chicago, and had also seriously interrupted railroad traffic in California, as well as causing innumerable minor disturbances in other localities throughout the West. The only grievance these people had against the railroad companies at that time was that some of them persisted in hauling Pullman cars which had been boycotted by the American Railway Union, on account of the strike of the operatives at the Pullman Works. The original controversy was almost wholly obscured in the great contest thus precipitated. It was clearly absurd that the railroad companies should be held responsible in any way for what had happened at the Pullman works. Yet they were suddenly involved, to the very great discomfort of vast multitudes of people whose welfare, convenience and even subsistence depend upon the regular movement of railroad traffic. It was not a petty strike of small consequence to anybody except those immediately involved, but was of such huge proportions that it really established another governing body in this country outside of that invested with power by the votes of the people. Taking no account of any acts of violence committed, the whole scheme of dominating and controlling the railroad service of the country was revolutionary. Recourse was naturally had to the officers of the law for their inter-

vention. The courts were appealed to. Injunctions were issued to restrain the leaders of the strike from their revolutionary acts, but they felt strong enough to defy the courts and persisted in their warfare on the railroad companies until overawed by the rapid assemblage of troops at the centers of disturbance. And now, five months after the acts were committed for which Debs and his associates were arraigned, so that all passion may be safely presumed to have subsided, the judgment of the court is rendered and they are found guilty. The public had found them guilty long since. No other judgment could have been rendered that would not have been in conflict with common sense.

The outcry of labor agitators that this is the end of all strikes, should the decision be sustained by the Supreme Court, is not well founded. In the estimation of a great many people it would not be a calamity if this were really the case. Workingmen of the highest intelligence, almost without exception, are opposed to strikes and do not recommend them except as a final resort in cases of actual oppression, extortion or injustice. The sympathetic strike, which was the kind inaugurated by Debs, is particularly condemned because so many innocent people are involved who may only have the most remote interest in the question to be settled, and cannot afford to lose their earnings and jeopard their positions for what is to them an abstract theory. It is true, however, that if the position of Judge Woods is sustained with regard to the responsibility of labor leaders for whatever may happen incidental to a strike, such responsibility may be too great a risk, and therefore striking may be discouraged. But why should this not be the case? If labor leaders precipitate a state of war on a peaceful community, and heads are broken, lives are lost and property is destroyed they are clearly responsible for it. If not, who is? But even this will not put an end to strikes. Men will take chances, just as Debs did after he knew that injunctions had been issued. It is, however, extremely probable that a few years will be permitted to elapse before another serious effort is made either by Debs or any ambitious imitator to tie up the entire railroad system of this country to redress a local grievance.

The very mild sentence which was imposed upon the offenders is to be commended. It is severe enough to emphasize the gravity of the case and not so severe as to impart to the proceedings any suspicion of persecution. A severe sentence would have aroused a feeling of sympathy for the labor leaders which would have blinded the judgment of the public upon the plain facts in the case.

Reports from the great agricultural States are disquieting. The weather has been excessively dry throughout the entire fall, and winter wheat has

suffered severely. It is stated that the season is the driest in twenty years, and the outlook for next year is filling agriculturists with gloom. The sections that suffered most seriously from drouth last summer are still enclouded with misfortune. It seemed bad enough that crops should fail and the feeding of cattle be a matter of difficulty, but it is now necessary in many localities to drive stock for miles to pools or sloughs for a little water. The price of grain has kept remarkably low in view of the conditions prevailing, there being almost a famine in a huge section of the West, but it is now predicted by careful observers free from speculative influence that consumption will so rapidly exceed receipts from farmers' stocks as to cause a steady appreciation in value. Should a dry winter succeed a dry summer and fall, bread will be considerably dearer next year and the epoch of low prices will pass away through the operation of one of the inexplicable processes of nature.

The Russian Armor Plate Contract

Such a little trifle as an additional cipher does not appear to trouble some of our enterprising modern journalists. The trade was startled this week by the announcement that the Bethlehem Iron Company had captured a contract for 12,000 tons of armor for the Russian navy. Such little facts as these, that the largest Russian ship yet built called for only 3300 tons and that our largest battle ships take about 2600 tons, and that \$4,000,000 would be a sharp cut in the price for such a quantity, do not seem to worry a reporter of the daily press.

The truth is that the Bethlehem Company have been awarded by the Russian government the order for the side armor of two new battle ships, and that the quantity amounts to about 1200 tons. It is understood by the makers that the armor will be nickel steel, Harveyized. Had the order been as large as reported, then the grave question would have arisen whether the Bethlehem Company could, during a considerable time, fill any new requirements for our own navy. As it is, the order will not interfere with their promptly delivering any work given out by our own Government. It is to be hoped that the call for additional ships which our navy has so urgently pressed upon Congress may be heeded. In the mean time it is a matter of which Americans may well be very proud that their representative and greatest works in this branch should have carried off so important a contract in a contest with every armor plate maker of any consequence in the world. It is only a few years since, when the Bethlehem company started, that our foreign friends smiled doubtingly over the vast attempt of Americans in embarking in a business in which they had no experience. Now the Bethlehem Company are in the front rank of makers and have proved their ability

to meet their competitors in neutral markets. Their success will be gratifying to every one engaged in the American iron industry.

The public hears only one aspect of the return of large quantities of American securities during the past two years. The persistent selling of railroad bonds and stocks by foreign investors has largely contributed toward forcing values down on this side of the Atlantic, and is probably responsible for a large part of the outflow of gold. The reasons for this selling are not far to seek. One circumstance which has been made the most of by interested persons in Europe is the outrageous lack of good faith shown in a few conspicuous cases by those who controlled the management of some large American systems. Flagrant as these cases have been, they have been magnified and misrepresented abroad as illustrating our business methods generally. Then the opportunities for lucrative investment have become less in this country as we are approaching steadily an equality of conditions, so far as the rate of interest as expressing growing abundance of capital is concerned. No one can tell how large has been in the aggregate the quantity of bonds and stocks, which we have been forced to purchase, at a price, during the past two years. Estimates, which really only the American banking houses with foreign connections can make, vary within very wide limits. But it is pretty certain that the total sum which they represent is far larger than our exports of gold during that period. In other words, we have become very much larger holders of our own securities than we have ever been. We are richer by that much. We have been paying outstanding debts. This country will get over the wrench which it has suffered in doing so at a time when we were little prepared to meet the obligation. When prosperity returns, the earnings of the capital thus thrust at us will stay at home instead of going abroad.

Thomas Sands of Middletown, Pa., is putting in plants for galvanizing by the "Flanders" improved process for the Marshall Foundry Company, at Troy, N. Y., and also for the Laconia Car Company, at Laconia, N. H. Contracts have been secured for three other plants in Pennsylvania and Ohio.

A somewhat remarkable find has been made at the Navy Yard, at Pensacola, Fla., where, in the sinking of an artesian well, a flow of natural gas was struck at a considerable depth. This is the first discovery of this element in the locality.

Congress will be asked to make an increased appropriation for the Bureau of the American Republics, the Secretary of State having decided that the United States is under obligation to continue the bureau for at least ten years from 1890.

OBITUARY.

JAMES LARMON.

The trade will learn with regret of the death of James Larmon, president of the Cincinnati Barbed Wire Fence Company, Cincinnati, Ohio, on the evening of the 12th inst., from organic disease of the heart. Mr. Larmon was in the forty-third year of his age, and was a good illustration of a self made man. Mr. Larmon was born at Paducah, Ky., and owing to his father's financial reverses was compelled early in life to provide for his own support, and with that end in view he migrated to Chicago, where for several years he was employed as a brakeman on the Chicago & Northwestern Railway. Naturally ambitious, however, he resigned this position and entered into the manufacture of barbed wire fencing, starting in with three machines only. After a brief period he was induced to settle in Cincinnati in 1881, where, having associated with him one or two others, he continued the manufacture of the fencing, the aggregate capital of the concern being less than \$5000. Only three hands were employed at the outset, but the works have grown until at the present time over 450 men are employed. Mr. Larmon was a prominent member of the Executive Committee of the Freight Bureau, Chamber of Commerce, Queen City Club and other organizations.

WILLIAM STORMONT.

William Stormont, who had been engaged in the foundry and machinist trades at Ottawa, Ill., for 40 years, died there on the 12th inst. He was born in Ireland in 1819, and when he first came to this country located for a short time in Chicago, removing thence to Ottawa.

JOHN HALDEMAN.

A private cablegram received at Lancaster, Pa., announces the death in London, England, on December 13, of John Haldeman, at one time prominent in the Pennsylvania iron manufacturing business. The deceased, who was in the seventieth year of his age, in his early life commenced the study of law, but soon gave it up in order to engage in the iron business at Bainsbridge, Pa. From 1850 to 1856 he operated the Windsor Iron Forge, near Churchtown, and then removed to Philadelphia, engaging in the manufacture of iron at the Fountain Green Iron Works. Later he was in the iron business at Duncan, Pa., and at Stamford, Conn., and afterward was president of a New York company which engaged in the manufacture of car springs. From 1872 to 1876 he again resided in Philadelphia, and in 1879 he removed to London, where he lived retired.

In the United States Circuit Court, at Pittsburgh, last week a bill in equity was filed by the Sullivan Machinery Company of New Hampshire against the Phillips Mine Supply Company of Pittsburgh, alleging an infringement of a patent car dumping apparatus. A preliminary injunction is asked for by the plaintiffs.

Judge Woods, at Chicago, on December 14, sentenced Eugene V. Debs, the leader of the American Railway Union strike, to six months' imprisonment in the county jail for violating the injunction issued by Judge Grosscup and himself on July 2 last. The

rest of the American Railway Union of officials, including G. W. Howard, vice-president; S. Kelliher, secretary, and six others, were at the same time each awarded three months' imprisonment. The defendants have appealed.

CORRESPONDENCE.

Coke Iron for Malleable Castings.

To the Editor: My attention has been attracted to articles in *The Iron Age* of November 22 and December 6 touching the successful substitution of Bessemer coke iron in malleable work for Lake Superior charcoal iron, heretofore generally used. It is true that the makers of Bessemer iron have made a considerable advance in the character of their product and have come to the point where, in whole or in part, it may be used for certain kinds of malleable castings. It may also be true that your informants have said that quite satisfactory results were reached in its use. You will hardly find, however, any manufacturer who would not, upon equal terms, prefer the product of Lake Superior ores smelted with charcoal—if obtainable on anything like equal terms.

The outcome of the advance, therefore, is not to displace charcoal iron, but rather to compel the makers of it to cheapen the expense of manufacture to a point but little above the price of Bessemer coke. From the fact that charcoal iron has always found a ready sale at a price far above coke iron of any class, the makers of the former have been content to adhere to ancient and expensive methods. Given, however, a furnace of the character and size of the average coke furnace of modern times, and I am quite certain that, suitably located, such a plant will produce iron as cheaply as it can be done with the other fuel. Indeed, it can even now successfully compete with the coke iron at any point where freights are equal.

In your article of the 22d ult. you refer to the extra care taken by producers of coke iron, in order that the user may be fully advised of the precise character of the metal. This method is not new. We have for many years employed a chemist, who analyzed every cast of the furnace, and have been enabled to give to customers the exact quality of iron which their custom or their needs might require. The conditions, therefore, which you place upon the producer of charcoal iron are already met, and your readers ought to so understand it.

So long as the superior forestry of the charcoal iron district shall last, the iron made with charcoal for fuel will certainly continue in the supremacy for malleable uses, at a price more or less above that of coke iron, depending somewhat upon the particular needs of the user.

It will be of interest to your readers to also know that the life of the charcoal iron business is greater than the life of any person now living.

I think, perhaps, you have been influenced by your environment to do a slight injustice to our brand of iron; but I also am confident that it was unwittingly done and that you will be very glad to set it right.

Very truly yours, J. C. HOLT,
Secretary Antrim Iron Company.

GRAND RAPIDS, MICH., December 15, 1894.

CURRENCY REFORM.

The *Banker's Magazine*, which has just entered upon its fiftieth year, under new management, has prepared the following comparison of the Baltimore and Carlisle plans for currency reform.

BALTIMORE PLAN.

SECTION 1. The provision of the National Banking act requiring the deposit of bonds to secure circulating notes hereafter issued, shall be repealed.

SEC. 2. Allow the banks to use circulating notes to the amount of 50 per centum of their paid up, unimpaired capital, subject to a tax of one-half of 1 per centum per annum upon the average amount of circulation outstanding for the year; and an additional circulation of 25 per centum of their paid up, unimpaired capital, subject both to the tax of one-half of 1 per centum per annum and to an additional heavy tax per annum upon the average amount of such circulation outstanding for the year; said additional 25 per centum to be known as "Emergency Circulation."

SEC. 3. The tax of 1 per centum per annum upon the average amount of circulation outstanding shall be paid to the Treasurer of the United States as a means of revenue, out of which the expenses of the office of the Comptroller of the Currency, the printing of circulating notes, &c., shall be defrayed.

The excess over one-half of 1 per centum of the tax imposed upon the "Emergency Circulation" shall be paid into the "Guarantee Fund," referred to in Section 6.

SEC. 4. The banks issuing circulation shall deposit and maintain with the Treasurer of the United States a "Redemption Fund" equal to 5 per centum of their average outstanding circulation, as provided for under the existing law.

SEC. 5. The redemption of the notes of all banks, solvent or insolvent, to be made as provided for by the existing law.

SEC. 6. Create a "Guarantee Fund" through the deposit by each bank of 2 per centum upon the amount of circulation received the first year. Thereafter impose a tax of one-half of 1 per centum upon the average amount of outstanding circulation, the same to be paid into this fund until it shall equal 5 per centum of the entire circulation outstanding, when the collection of such tax shall be suspended, to be resumed whenever the Comptroller of the Currency shall deem it necessary. The notes of insolvent banks shall be redeemed by the Treasurer of the United States out of the "Guarantee Fund," if it shall be sufficient, and if not sufficient, then out of any money in the Treasury, the same to be reimbursed to the Treasury out of the "Guarantee Fund," when replenished either from the assets of the failed banks or from the tax aforesaid. National banking associations organized after this plan shall have gone into operation may receive circulation from the Comptroller of the Currency upon paying into the "Guarantee Fund" a sum bearing the ratio to the circulation applied for and allowed that the "Guarantee Fund" bears to the total circulation outstanding, and to be subject to the tax of one-half of 1 per centum per annum, as called for by the Treasurer of the United States for the creation and maintenance of this fund. No association or individual shall have any claim upon any part of the money in said "Guarantee Fund," except for the redemption of the circulating notes of any insolvent National banking association. Any surplus or residue of said "Guarantee Fund," which may be hereafter ascertained or determined by law, shall inure to the benefit of the United States.

SEC. 7. The Government shall have a prior lien upon the assets of each failed bank and upon the liability of shareholders, for the purpose of restoring the amount withdrawn from the "Guarantee Fund" for the redemption of its circulation, not to exceed, however, the amount of failed bank's outstanding circulation after deducting the sum to its credit in the "Redemption Fund" (Section 4) already in the hands of the Treasurer of the United States.

SEC. 8. Circulation can be retired by a bank at any time upon depositing with the Treasurer of the United States lawful money in amount equal to the sum desired to be withdrawn, and, immediately upon such deposit, the tax indicated in Sections 2, 3 and 6 shall cease upon the circulation so retired.

SEC. 9. In the event of the winding up of the business of a bank by reason of insolvency, or otherwise, the Treasurer of the United States, with the concurrence of the Comptroller of the Currency, may, on the application of the directors, or of the liquidator, receiver, assignee, or other official, and upon being satisfied that proper arrangements have been made for the payment of the notes of the bank, and any tax due thereon, pay over to such directors, liquidator, receiver, assignee, or other proper official, the amount at the credit of the bank in the "Redemption Fund," indicated in Section 4.

SECRETARY CARLISLE'S PLAN.

SECTION 1. Repeal all laws requiring or authorizing the deposit of United States bonds as security for circulation.

SEC. 2. Permit National banks to issue notes to an amount not exceeding 75 per cent. of their paid up and unimpaired capital, but require each bank before receiving notes to deposit a "Guarantee Fund," consisting of United States legal tender notes, including Treasury notes of 1890, to the amount of 30 per cent. upon the circulating notes outstanding, to be maintained at all times, and whenever a bank retires its circulation, in whole or in part, its "Guarantee Fund" to be returned to it in proportion to the amount of notes retired.

SEC. 3. Retain the provision of law making stockholders individually liable, and provide that the circulating notes shall constitute a first lien upon all the assets of the bank.

SEC. 4. Impose a tax of one-half of 1 per cent. per annum, payable semi-annually, upon the average amount of notes in circulation, to defray the expenses of printing notes, official supervision, cancellation, &c.

SEC. 5. No National bank note to be of less denomination than \$10, and all notes of the same denomination to be uniform in design; but banks desiring to redeem their notes in gold may have them made payable in that coin. The Secretary of the Treasury to have authority to prepare and keep on hand ready for issue upon application a reserve of blank National notes for each banking association having circulation.

SEC. 6. Require each National banking association to redeem its notes at its own office, or at its own office and at agencies to be designated by it.

SEC. 7. To provide a safety fund for the immediate redemption of the circulating notes of failed banks, impose a tax of one-half 1 per cent. per annum upon the average circulation of each bank until the fund amounts to 5 per cent. of the total circulation outstanding. Require each new bank, and each bank taking out additional circulation, to deposit its proper proportion of this fund before receiving notes. When a bank fails, its guarantee fund held on deposit to be paid into the safety fund and used in the redemption of its notes, and if this fund shall be impaired by the redemption of the notes of failed National banks, and the immediately available cash assets of such banks are insufficient to re-establish the fund, it shall at once be made good by *pro rata* assessments upon the other banks, according to the amounts of their outstanding circulation; but there shall be a first lien upon all the assets of the failed bank or banks, to reimburse the contributing banks. The safety fund may be invested in outstanding United States bonds having the longest time to run, the bonds and the interest upon them to be held as part of the fund and sold when necessary to redeem notes of failed banks.

SEC. 8. Repeal the provisions of Reorganization and Extension act of July 12, 1882, imposing limitations upon the reduction and increase of National bank circulation.

SEC. 9. Repeal all provisions of law requiring banks to keep a reserve on account of deposits.

SEC. 10. The Secretary of the Treasury may, in his discretion, use any surplus revenue of the United States in the redemption and retirement of United States legal tender notes, but such redemptions shall not in the aggregate exceed an amount equal to 70 per cent. of the additional circulation taken out by National and State banks under the system herein proposed.

SEC. 11. Circulating notes issued by a banking corporation duly organized under the laws of any State, and which transacts no other than a banking business, shall be exempt from taxation under the laws of the United States when it is shown to the satisfaction of the Secretary of the Treasury and Comptroller of the Currency: (1) that such bank has at no time had outstanding its circulating notes in excess of 75 per cent. of its paid up and unimpaired capital; (2) that its stockholders are individually liable for the redemption of its circulating notes to the full extent of their ownership of stock; (3) that the circulating notes constitute by law a first lien upon all the assets of the bank; (4) that the bank has at all times kept a guarantee fund in United States legal tender notes, including Treasury notes of 1890, equal to 30 per cent. of its outstanding circulating notes; and (5) that it has promptly redeemed its notes on demand at its principal office, or at one or more of its branch offices, if it has branches.

SEC. 12. The Secretary of the Treasury may, under proper rules and regulations to be established by him, permit State banks to procure and use in the preparation of their notes the distinctive paper used in printing United States securities; but no State bank shall print or engrave its notes in similitude of a United States note, or certificate, or National bank note.

PERSONAL.

G. L. Luetscher has resigned his position as superintendent of the open hearth department of the Otis Steel Company, Limited, at Cleveland, to assume the management of the Granite City Steel Company of Granite City, near East St. Louis, Ill. The company will have three basic and one acid open hearth furnace, a blooming mill, plate mill and sheet mills and is to be completed by June 1, 1895. It is controlled by the Niedringhaus interest of the St. Louis Stamping Company.

Philip G. Roeder of Cleveland, who has had a wide experience in Mexico, has been appointed resident agent of a number of manufacturers, among whom are the Laidlaw, Gordon & Dunn Company, the Lodge & Davis Machine Tool Company, the Lane & Bodley Company, J. A. Fay & Egan Company, all of Cincinnati, and the Howard-Harrison Iron Company of St. Louis and Bessemer, Ala.

Frank Wick has resigned his position as manager of the mills of the Mahoning Valley Iron Company, Youngstown, Ohio, and has been succeeded by William F. Bonnell.

Karl Mannesmann, one of the four brothers, has arrived to aid in the building of the tube plant which is being put up at Hartford, Conn. He has had special experience in producing bicycle tubing.

Henry Wick, J. G. Butler and W. H. Baldwin, of the Ohio Steel Company, at Youngstown, attended a conference last Friday.

The increasing probability of a strike of the local miners of the Pittsburgh district, as a result of the reductions by the operators of the mining rate from 60 cents to 55 cents per ton, is reported to be causing considerable anxiety among the manufacturers of the district. The present supply of coal is not sufficient to keep them going during the continued strike. Within the past week 15,000,000 bushels of coal from the river mines have been shipped to Southern ports by water, and the railroad mines have been shipping largely to lake ports previous to the closing of lake traffic. This leaves the visible supply greatly depleted, and a general cessation of work among the miners will cause great embarrassment to manufacturers. A strike in the Pittsburgh district would affect 15,000 miners and indirectly many thousands more.

The Senate Committee on Naval Affairs had the armor plate resolution under consideration at its last meeting, and postponed final action on it until the next meeting. The members of the committee were furnished with printed copies of the testimony of Secretary Herbert taken before the committee at its last meeting, in which the Secretary explains why he did not divert the contract.

A Chicago syndicate is reputed to have bought the properties of the Van Dyke, Sweetwater and Rock Springs Coal companies, comprising all the mines at Rock Springs, Wyo., not controlled by the Union Pacific Company. The syndicate is said to have bought mines in Kansas and Nebraska, and to have secured options on others in Indiana, Illinois and Ohio.

MANUFACTURING.

Iron and Steel.

A serious accident occurred at the Duquesne Steel Works, Duquesne, Pa., last week, by reason of which part of the plant has been compelled to shut down until necessary repairs can be made.

In the Bessemer plant of the Bellaire Nail Works, Bellaire, Ohio, on one night recently, No. 1 turn made 65 heats, or 313 tons of steel.

Hannah Furnace, of the Mahoning Valley Iron Company, Youngstown, Ohio, has been blown out and a new lining, hearth and bosh will be put in immediately. The furnace is expected to be ready for blast again in about six weeks.

Kirkpatrick & Co., Limited, of Pittsburgh, operating the Leechburg Iron Works, Leechburg, Pa., manufacturers of fine sheet iron and sheet steel, have lately bought out the business of J. S. Ingalls & Co. of Troy, Ohio. This concern have been making planished steel for a number of years, but the plant has been removed to Leechburg and some important additions made, and operations were commenced a few days ago. The product is known as "Craig Polished Steel," and was made by J. S. Ingalls & Co. for eight years at Troy, Ohio. Kirkpatrick & Co., Limited, have also bought the patents under which Ingalls & Co. operated, and Mr. Craig, patentee of the process, has charge of this branch of the business for Kirkpatrick & Co., Limited.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh, manufacturers of rolling mill and tin plate machinery and engines, have secured a contract from the Baltimore Iron, Steel & Tin Plate Company of Baltimore, Md., for the entire machinery for their new tin plate plant to be erected at Locust Point, Md.

On Monday, December 10, in the Federal Court at Cincinnati, a receiver was appointed for the Spathite Iron Company of Nashville, Tenn., who have been operating the furnace at Florence, Ala. The appointment of receiver was understood to be a temporary matter, as arranged by Col. Thos. Sharp, president of the company, in connection with the bondholders and some of the principal creditors. It is expected that money will be raised and the furnace put into operation at an early date.

Williams, White & Co. of Moline, Ill., have recently installed three large steam hammers in the works of the Heath Rail Joint Company, at Chicago Heights, a Chicago suburb. The hammers are capable of being used for regular forging purposes or as heavy drops.

Charges were made against E. C. Caleyron, receiver of the White River Iron & Steel Works, at Muncie, Ind., which at first threatened to prevent the transfer of the works to T. F. Rose, who purchased them at the receiver's sale. It was shown that the charges were the result of misinformation, and the sale of the plant was therefore confirmed last week.

Work has been started on the buildings to be erected at Alexandria, Ind., by the purchasers of the defunct New Albany Rail Mill Company's property. Reports that a steel rail mill is to be built are not well founded, but are evidently based on the name of the old company. Light rails may be rolled, but the product will be bars, angles and sheets.

Prior to the organization of the Shelby Steel Tube Company, at Shelby, Ohio, in December, 1890, all the steel tubing used in the United States was manufactured in England. The company began the erection of works, on a small scale, in March, 1891, but in the course of 18 months the demand for their product had increased to such an extent that the erection of three additional buildings, 300 x 70, 160 x 70 and 200 x 60 feet in size, respectively, was necessary. During 1892 another company was organized and erected what is now known as Works No. 2, but the stockholders being largely the same, and their interests closely allied, the two companies shortly afterward consolidated. At present about 200 men are employed, part of the time on double turn, and within the next two weeks the company expect to be running the entire plant constantly day and night, and employing 260 men. The product of the works goes into bicycles principally, though it is largely used in the manufacture of spindles, shuttles, gun barrels, hollow augers, crank shafts, &c. The output and shipments for the month of November

amounted to 450,000 feet of tubing. The company claim as a feature of the product of their works that this product is drawn cold without weld or seam, being perfectly smooth inside and out. The uniformity of the tensile strength and ductility of these tubes is such that no margin is required for possible flaws in material and a saving in weight is the result. Tubing as small as $\frac{1}{8}$ inch and as large as $2\frac{3}{4}$ inches in diameter is produced. The officers of the company are D. L. Cockley, president and manager; W. W. Skiles, vice-president; J. C. Pattison of Boston, treasurer, and H. H. Cockley, secretary. The directors are D. L. Cockley, J. C. Pattison, B. J. Williams, W. W. Skiles, J. A. Seltzer of Shelby, Col. A. A. Poole of Boston, Geo. H. Day of Hartford, Conn.

In spite of hard times in the iron trade, the East Lebanon Rolling Mill Company of Lebanon, Pa., have done a very satisfactory business during the past year. It is stated that the company will declare a 10 per cent. dividend on January 1.

General Superintendent C. W. McKinney of the Lackawanna Iron & Steel Company says that No. 2 Furnace, at Lebanon, Pa., which is now undergoing improvements, will be ready to blow in by February 1. As soon as No. 2 is in blast No. 1 will be blown out and also enlarged and improved.

The plant of the Cumberland Nail & Iron Company, at Bridgeton, N. J., is entirely idle.

The Naugatuck Malleable Iron Company, at Naugatuck, Conn., have placed the contract for their new annealing room with the Berlin Iron Bridge Company, of East Berlin, Conn. The building will be 94 feet wide and 175 feet long, constructed entirely of fireproof construction.

A company have been formed under the title of the Eleanor Iron Company, who have leased with option of purchase the old Juniata Rolling Mill, Hallydaysburg, Pa. It is intended to manufacture muck bars for use at the works of the Tyrone Iron Company, located at Tyrone Forges. It is expected that the works will be in full operation by the first week in January. Along with the muck bar department there is a finishing mill in which all sizes of merchant and bar iron will be manufactured. This will be started as soon as trade warrants.

The Shoenberger Steel Company, of Pittsburgh, have made application for a charter of incorporation.

The blast furnace of the Warwick Iron Company, Pottstown, Pa., has been in blast continuously since October 1, 1892, and has turned out over 100,000 tons of iron. In one week recently the output was 1164 tons, which has only once been exceeded by this furnace.

The new tin house in course of erection by the Wheeling Corrugating Company, Wheeling, W. Va., is rapidly approaching completion, but as yet it is uncertain when the plant will be ready for operations.

At a recent meeting of the stockholders of the Junction Iron Company, Wheeling, W. Va., held in that city, the directors were authorized to apply to the Secretary of State for the right to increase the capital of the concern from \$400,000 to \$600,000, and to change the name to the Junction Iron and Steel Company. It will be remembered that this concern recently purchased the half interest of the Laughlin Nail Company in the plant of the Laughlin & Junction Steel Company, at Mingo, Junction, Ohio.

The New Castle *Guardian*, New Castle, Pa., recently printed a statement showing the total monthly pay rolls of the various industrial establishments in that city. The following amounts per month were given for the concerns named as follows: New Castle Wire Nail Company, \$25,000; Shenango Valley Steel Company, \$22,000; New Castle Steel & Tin Plate Company, \$20,000; Arethusa Iron Works, \$16,000; New Castle Rod Mill, \$12,000; Atlantic Iron Works, \$13,000; Baldwin & Graham Stove Works, \$10,000; Rosena Furnace, \$5000; Aetna Furnace, \$5000; Raney & Berger Furnace, \$5000; Red Jacket Furnace, \$5000; Vulcan Iron Works, \$4000. Other foundries and machine shops, \$7000. The total for all these is \$149,000; for glass and other industries, \$39,000, making \$188,000 a month or \$2,256,000 a year, providing all were operated steadily through the twelve months.

Machinery.

The Board of Directors of the Westinghouse Air Brake Company of Pittsburgh

have declared a quarterly dividend of 5 per cent., payable to stockholders of record on January 10, 1895.

The Board of Directors of the Westinghouse Machine Company of Pittsburgh have declared a quarterly dividend of 1½ per cent. on the preferred and common capital stock of the company, payable January 20, 1895, to stockholders of record December 20, 1894.

The L. E. Rhodes Company of Hartford, Conn., are finding that their improved stopping and starting device for hand lathes is meeting with hearty approval. It effects a considerable saving on all lathe work requiring frequent stops and changes.

A plan for the reorganization of C. Aultman & Co., manufacturers of threshers and engines, Canton, Ohio, has been submitted to the creditors of the concern, and has already received the approval of a large percentage of them. It is expected that the necessary 75 per cent. will sign within a week. The stockholders of the old firm put in a large amount of money and assets aggregating about \$700,000. For the balance of the debt, it is proposed that a new company shall take the assets and issue bonds payable in ten years, with a sinking fund to begin after the second year, which will provide for the gradual retirement of the whole issue. It is expected the new company will get into operation not later than February 1. It is understood the committee have agreed upon a strong management for the concern. It will manufacture the well known Aultman & Co. engines and threshers, and will likely take up some other lines of manufacture which have been under consideration by the parties in interest, but cannot be decided upon until the new company is organized.

The new works of the Buckeye Mfg. Company, manufacturers of the Lambert gas engine, at Anderson, Ind., are treble the capacity of the company's old plant at Union City, Ind., and the equipment is superior. No pains have been spared in the aim to secure every possible economy in manufacturing cost. The new works have a capacity for two gas engines, 500 ironed carriage poles, 1000 pairs of ironed vehicle shafts and 1000 finished neck yokes per day, besides large quantities of the company's other specialties in hardware and carriage lines. Power is furnished by three Lambert gasoline engines located in different departments. The company have flattering prospects for a heavy trade the coming season on all their lines.

The J. I. Case Threshing Machine Company of Racine, Wis., will resume operations on or about January 1 with a full force of men, except in the engine shop. They have a large plant which has been entirely idle for a number of months.

The Shaw Electric Crane Company of Muskegon, Mich., have received orders from the Pharo Machine & Foundry Company of Ansonia, Conn., for three cranes, two of 15 tons capacity and one of 10 tons.

The Bridgeport Pipe Company, Bridgeport, Ala., have begun the erection of a machine shop, 40 x 100 feet in size.

The Fairhaven Iron Foundry, at Fairhaven, Conn., have largely increased their melting capacity by the addition of a new Whiting cupola.

Cagnon & Freres' foundry, at Quebec, Canada, has been destroyed by fire at a loss of \$35,000.

The Derwent Foundry Company, Ellwood City, Pa., manufacturers of light and heavy iron castings and making a specialty of electrical castings, are about making some changes and improvements in their plant, with a view of taking on some other lines of manufacture, the nature of which has not as yet been fully determined.

Hardware.

The factory of the United States Standard Scale Company, Newark, N. J., was destroyed by fire on the 15th inst.

The Anderson Tack Company, Rockland, Mass., has been dissolved, and James Anderson will conduct the business alone. The tack factory, which was partly destroyed by fire several months ago, will be rebuilt and Mr. Anderson expects to begin work as soon as it is completed.

It is reported that the Hartford Spring and Axle Company, Norfolk, Conn., are investigating the advantages of Dunkirk, N. Y., with a view to locating their plant there.

The plant of the Champion Shovel Company, at Phillipsburg, Pa., was destroyed

by fire on the 12th inst., together with a large stock of finished and unfinished product. Loss, \$7000; insurance, \$3000.

George H. Bishop & Co. of Cincinnati, Ohio, have recently erected a plant at Lawrenceburg, Ind., for the manufacture of edge tools, saws, &c., and are now working full force.

The Keystone Mfg. Company of Pittsburgh have recently commenced operations, and will manufacture a line of wire woven goods. The plant is 34 x 124 feet in size and gives employment to about 30 hands.

The Hurd Refrigerator Company, at New Duluth, Minn., have started up their factory to make stock for the spring trade.

The Gale Center Lock and Safe Company are arranging to complete and equip their factory at Gale City, Ind. The building was erected some time since, but the completion of the plant was deferred until the general condition of the country improved.

Miscellaneous.

The Board of Directors of the Philadelphia Natural Gas Company of Pittsburgh have declared a quarterly dividend of 1 per cent.

The Ellerslie Coal & Coke Company of Winfred, W. Va., have let a contract for the erection of a block of 100 coke ovens at their plant. The concern will also put in a rope haulage system and will introduce mining machinery.

The American Porcelain Company of New Brighton, Pa., have been organized and have purchased the plant of the Scott Tile Works at that place, and will at once fit it up with new machinery for the manufacture of sinks, washstands and other heavy pottery goods from native clay. The capital stock of the new concern is \$50,000 and the officials are as follows: Thomas E. Marshall, president and general manager; W. A. P. William, secretary and treasurer; Thomas Craven, superintendent.

The Buckeye Malleable Iron & Coupler Company have been organized at Columbus, Ohio, with a capital stock of \$500,000. The concern will manufacture exclusively the Buckeye automatic car coupler, as well as other malleable iron castings. The concern note a very large demand for couplers and expect to increase their capacity for the manufacture of them in a short time. The officers of the firm are W. T. Goodspeed, president and treasurer, and T. P. Linn, secretary.

The American Iron Brake Beam Company are making considerable improvements in their plant at Waukegan, Ill. They are erecting a new building, 200 x 60 feet, to be used as a factory, after the completion of which their old factory will be used for storage purposes.

The assigned plant of the Robinson Machine Company, located at Bellwood, Pa., has been disposed of to D. L. Wray and Ira Wentzell of Bellwood, and C. M. Robinson of Altoona, for \$4000. The new firm own the right to manufacture a heating system known as the "Popular hot water fireplace," orders for a large number of which, it is stated, are already on hand. They will start at once to manufacture these, and will also build electric car trucks, for which purpose the plant was erected.

There is reason to believe that at least part of the shops of the Michigan-Peninsular Car Company, at Detroit, Mich., will start up within 30 days.

The Esterly Harvester Company of Minnesota, Minn., have made an assignment to A. M. Allen. This move was made, it is said, to effect a reorganization. The plant was moved to Minneapolis from Whitewater, Wis., and has been the victim of some litigation. The directors say it will be operated on a larger scale than ever before.

The factory of the Meyer United States Standard Scale Company, at Newark, N. J., has been burned. The loss has been placed at \$75,000, about one-third of which is covered by insurance.

The Kanawha and New River Coal and Coke Company, Charleston, W. Va., chartered a few weeks ago with a capital stock of \$1,500,000, for the purpose of distributing and apportioning the entire output of the Kanawha and New River coal and coke fields and fixing the prices and rates, has been organized. M. T. Davis was elected president and J. J. Dickinson secretary and treasurer. A manager will be located at Cincinnati, Ohio. The concern is said to

include in its membership 90 per cent. of the New River and Kanawha production.

The Standard Scale and Supply Company, Ltd., Bellefonte, Pa., have opened a branch office in the Bullitt Building, Philadelphia, with A. H. Chesley as manager.

Warren Webster & Co., Camden, N. J., report that the demand for their specialties is good, especially as regards their Webster vacuum feed water heaters and purifiers. Among the large contracts for heaters recently completed, and in course of completion, they mention the following plants: Wheeling Steel & Iron Company, 2000 horse-power; Morrison & Cass Paper Company, Tyrone, Pa., 1500 horse-power; Harrisburg Rolling Mill Company, Harrisburg, Pa., 1250 horse-power; Laidlaw Dunn Gordon Company, Cincinnati, Ohio, 600 horse-power; North Packing & Provision Company, Somerville, Mass., 500 horse-power; Warren Electric Light Company, Warren, Pa., and Schaeffer Aniline Chemical Company, Buffalo, N. Y., each, 400 horse-power; Bamford Bros., Paterson, N. J., 900 horse-power; Kankana Fibre Company, Oconto Falls, Wis., 300 horse-power; Jerseyville Electric Light, Gas & Power Company, Jerseyville, Ill., 350 horse-power; Lamb Mfg. Company, Chicopee Falls, Mass., 300 horse-power, and the Jersey City Milling Company, Jersey City, N. J., 300 horse-power. The latest contract received is one from the Pennsylvania Steel Company, Steelton, Pa., aggregating 9250 horse-power, and awarded to the firm on account of the good results obtained from former installations which they have made in the same works. The new contract consists of four heaters, one of 3000 horse-power capacity for the merchant mill; another of 1250 horse-power capacity for the blooming mill; another of 2000 horse-power capacity for the No. 2 blast furnace, and another of 3000 horse-power capacity for blast furnaces Nos. 3 and 4.

Negotiations are now pending looking to the laying of a natural gas line into the city of Zanesville, Ohio. It is understood that the necessary surveys have been made and active work is expected to be commenced within a short time.

The Fayette Mfg. Company, Incorporated, Lewis Block, Pittsburgh, Pa., manufacturers of silica brick, sand brick, magnesia brick and basic refractories have been appointed sole agents in this country for Carl Spaeter, Coblenz, Germany, for the sale of calcined magnesian in all its forms for basic practice.

The shipbuilders, ship owners and others directly and indirectly identified with the shipbuilding industry of Bath, Maine, recently held a mass meeting for the purpose of denouncing the proposed free ship bill. Shipbuilding, as is well known, is Bath's one industry, and its destruction and the prosperity of the city is threatened, according to the view taken by the citizens. A resolution to Congress was framed and will be sent to Washington.

No final conclusion has yet been reached in the negotiations between Reinhard Mannesmann and the receivers of the Troy Steel & Iron Company concerning the building of a tube plant.

The Colorado Fuel Company of Pueblo, Col., are testing on a large scale some iron ore obtained at mines being developed in New Mexico. Lawrence Perkins of New York and some Philadelphia parties are interested in the property.

The puddle mill of the Alabama Rolling Mill Company, Birmingham, Ala., will resume operations in full on January 7, and the finishing mill will go on double turn in all departments one week later. Improvements recently added at these works will increase their production to 2400 tons per month and will enable the company to offer prompt shipment of their full line of sizes.

The Iron and Metal Trades.

Rumors of pools are exceedingly numerous. One story has it that the leading Lake Superior Ore interests have effected an arrangement by which some of the mines will close down for a consideration and prices will be advanced. In other quarters it is stated that the Ore companies have merely agreed not to sell for next year at present prices. Another report is current concerning an attempt to reach an understanding among the furnaces of the two Valleys. Then the Barb Wire makers, undaunted by their recent failure in keeping a newly born combination from prompt collapse, are again at work patching up their difficulties. In the Rail trade movements are on foot which look to clearing away possible sources of danger in the Central and Far West.

It is not astonishing that means are eagerly sought to escape from the present desperate condition of affairs. In many branches prices are lower than they have ever been before. While the volume of work is fair compared with some periods during the past two years, it threatens to fall off during the next few months. There have even been a few signs of lack of confidence in better things to come for spring and summer. Coke is being sold at low prices for the first six months of the year. Some few furnaces have been able to contract for Lake Ores at this season's lowest figures up to next October, and buyers of Bessemer Pig have found that a few producers, at least, were willing to sell well into spring.

The whole condition of affairs is putting producers into a frame of mind when they listen more patiently to proposals of peace with its prospect of modest returns on investment and for labor and skill.

The indications of an accumulation of Iron and the prospect that the holiday stoppages for repairs, &c., will further add to stocks, have created an eagerness to capture buyers for spot Bessemer. The result is that the Valley furnaces have dropped below the record made and have sold at \$9.50 at furnace.

Steel Billets have sold down to \$15 at Pittsburgh, one lot of 8000 tons for a Rod mill having been placed at that figure, which is as low as any touched thus far in this country. A leading interest in Pittsburgh is reported to have turned seller after being out of the market for a considerable time. It is estimated that its sales have amounted to about 30,000 tons.

Philadelphia reports a somewhat better demand for Finished Material, among the sales being some fair orders for Ship Plates. Pittsburgh looks forward to taking an order for 25 miles of 6-inch Pipe for the Ohio Gas Belt. There is some business doing East and West in Bridge work and in Structural Material, but it is not enough to keep all cheap sellers busy and low prices generally prevail. Some of the larger car orders have been withdrawn in the Central West, but there is quite a run of small contracts.

In Foundry Iron reports are conflicting. Wall street has been informed that the leading Southern Company has 172,000 tons of orders on its books, and proposes to ask an advance of \$1 per ton. Other sellers, North and South, are not showing any disposition to bestow the flattery which imitation implies. On the contrary, Cincinnati has been quite

a lively battle ground, with values irregular and lower. Philadelphia reports a somewhat better feeling.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., December 18, 1894.

The market appears to have assumed a better tone during the past few days, inquiries having been quite numerous, while some very nice orders have been definitely closed. Prospects are better than they were earlier in the month, and it begins to look as though there would be no necessity for any protracted suspension of work after the Christmas holidays. Mills have taken in quite a batch of work, and if other orders come in, as seems probable from the number and character of inquiries, the usually dull period will be tided over very nicely. Prices are, of course, very low, but that business can be had in moderately liberal quantities and without further concessions from quoted rates is very gratifying, as there was some apprehension that holiday dullness would develop holiday weakness.

Pig Iron.—A good deal of Iron has been taken during the past week and prices have been well maintained. The increase in production and the increase in stocks appear to have had no appreciable influence thus far, and if the market can be held two or three weeks longer there may be a chance for better prices. At present sellers meet the demand quite freely, but there is no disposition to make concessions, so that if consumers want Iron there is no alternative but to pay quoted rates. Furnaces in this vicinity are well sold up, and as most of the Southern furnaces make similar pretensions, there is no necessity for sales that would involve concessions. The weakest markets appear to be those west of the Alleghanies, but they are not low enough to permit shipments to this market at current rates of freight. Under present conditions it is hardly likely that any upward movement can be started, but recent transactions will tend to steady the market, and it is hoped will prevent any tendency toward further weakness. A good deal depends on what consumption will be during the first quarter of the year, but with a production already 80 % greater than that of a year ago, conservatism is necessary in making predictions in regard to that matter. Meanwhile orders are easily placed at the inside quoted rates for large lots, but on favorite brands, or for small lots, medium to outside figures are obtained for delivery equivalent to Philadelphia, with 25¢ to 40¢ less at points within a radius of 100 miles South or West:

Bessemer.....	\$12.00	@	\$12.25
Standard No. 1 Foundry X....	12.50	@	13.00
Standard No. 2 Foundry X....	11.50	@	11.75
No. 2 Plain.....	10.75	@	11.00
No. 1 Soft.....	11.50	@	11.75
No. 2 Soft.....	10.75	@	11.00
Standard Gray Forge.....	10.50	@	10.75
Ordinary.....	10.25	@	10.50

Steel Billets.—The market is dull and prices still somewhat in buyers' favor. The usual asking price is \$17 50 @ \$17 75, delivered, but large buyers have shaded the inside figure, and could probably do so yet if the right kind of a bid was made. Stocks are pretty well reduced, and it is said that some large transactions are in temporary abeyance, but for the present consumers seem inclined to wait developments. There are sellers to day of 1000-ton lots at \$15.25, but some buyers are standing out for still lower figures.

Finished Material.—A better feeling seems to pervade this department, and,

although prices are low, business can be had, and some valuable additions have been made to the order books of several of the local mills. Besides a good run of small orders, a considerable amount of Bridge and Structural work has been taken, as well as orders for Plates for barge building. One lot of 700 tons was taken for this purpose on Monday, and another of 1000 tons is probably closed by this time, and it is said that others of the same character will follow in the not distant future. On the whole, therefore, the Finished Material trade looks better than it has for some time past, although prices are extremely low, with no intimation that manufacturers are likely to try for anything better until there is a wider distribution of business, which can hardly be expected until well into the coming month. Special quotations are given on large lots, but for the general run of business, delivered, prices are about as follows:

Grooved Skelp.....	1.25¢	@	1.20¢
Standard Refined Bars.....	1.15¢	@	1.25¢
Medium quality.....	1.05¢	@	1.10¢
Tank Steel.....	1.25¢	@	1.30¢
Heavy Plates.....	1.25¢	@	1.30¢
Shell.....	1.50¢	@	1.60¢
Flange.....	1.60¢	@	1.80¢
Angles.....	1.25¢	@	1.35¢
Beams and Channels.....	1.30¢	@	1.40¢

Old Material.—There is little or nothing doing in the way of new business, but there is a fair inquiry for deliveries after the turn of the year. Prices are steady, with some tendency to ask more money, but ordinarily business can be done at about last week's prices, viz.:

Heavy Melting Steel.....	\$10.00	@	\$11.00
Light Melting Steel.....	8.00	@	8.50
No. 1 Wrought Scrap.....	11.00	@	11.50
Machinery Cast.....	9.00	@	10.00
Wrought Turnings.....	8.00	@	8.50
Cast Borings.....	6.25	@	6.75
Old Iron Rails.....	12.00	@	12.50
Old Car Wheels.....	10.00	@	10.25
Old Iron Axles.....	15.50	@	16.50

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 19, 1894.

Pig Iron.—Only a few firms are now reporting any business. Here and there some Iron is being bought to finish up the work of the year, but in a general way consumers are deferring purchases until after the beginning of 1895. Some inquiries are coming out as feelers, especially on soft grades of Southern Iron. Buyers are inclined to think that prices may be a little lower, and are therefore proceeding slowly. Several of these inquiries are for fair sized lots, with deliveries extending over the greater part of next year. The leading Southern companies are either asking full prices on such business or absolutely refusing to quote on long deliveries. The local furnace companies have booked so much business that the prospect of their maintaining prices is excellent. Lake Superior Charcoal continues in only moderate demand. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00	@	\$14.00
Local Coke Foundry, No. 1.....	10.25	@	10.50
Local Coke Foundry, No. 2.....	9.75	@	10.00
Local Coke Foundry No. 3.....	9.50	@	9.75
Local Scotch.....	10.50	@	11.00
Ohio Strong Softeners No. 1.....	12.50	@	13.00
Southern Silvery, No. 1.....	11.50	@	11.75
Southern Silvery, No. 2.....	11.25	@	11.50
Southern Coke, No. 2.....	10.25	@	10.50
Southern Coke, No. 3.....	9.75	@	10.25
Southern, No. 1 Soft.....	10.25	@	10.50
Southern, No. 2 Soft.....	10.00	@	10.25
Alabama Car Wheel.....	17.50	@	18.00
Jackson County Silvery.....	15.50	@	16.00
Other Ohio Silvery.....	14.25	@	14.50
Coke Bessemer.....	11.00	@	11.50
Coke Malleable.....	11.00	@	11.50
Spiegel Eisen 20 %.....	26.00	@	26.00

Bars.—Very little new business has recently been placed, but inquiries are

being received for lots of more or less importance with deliveries extending far into next year. Some of these come from car works and may be based on prospective business, but nevertheless strong hopes are entertained that the orders will actually be placed. A good basis for these hopes is provided by the fact that orders for small lots of cars have recently been more numerous. It is true that some of the largest car inquiries have been withdrawn, but these are being replaced by a greater number of small orders. The demand from general consumers is quiet, but intimations are given out that a great deal of buying will take place in January. Quotations are continued at 1.05¢ @ 1.10¢, Chicago, for mill shipments of Common Iron; 1.15¢ @ 1.20¢ for guaranteed Iron, and 1.20¢ @ 1.25¢ for Soft Steel Bars from strictly Billet stock. A larger movement is noted from jobbers' stocks, and prices are well held at 1.20¢ upward for Iron and 1.30¢ upward for Soft Steel.

Structural Material.—While the week has been rather quiet in actual contracts, the inquiry has been considerably better for building and bridge material for future delivery. The reported disagreement over wages at a prominent Pittsburgh works causes considerable interest here, as the closing of those works for any considerable time would have a marked effect on prices. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢ @ 1.50¢; Angles, 1.35¢ @ 1.40¢; Tees, 1.65¢; Universal Plates, 1.35¢ @ 1.40¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.85¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—The situation is unchanged. The local demand continues small. The prospects, however, are a little better for maintaining prices, orders having been secured the past week by some manufacturers rather unexpectedly, their prices not being the lowest. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.50¢ @ 2¢; Fire Box, 2¢ @ 4.50¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.90¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, weak at 75 % off.

Sheets.—A moderate trade only is now being done in Black and Galvanized Sheets. The inquiry for future delivery is fair, but it does not promise a very heavy volume unless manufacturers should be willing to contract for delivery up to June. Such terms, however, are not regarded as attractive. Quotations on mill shipments are repeated at 2.30¢ @ 2.35¢, Chicago, for No. 27 Common Black, 2.40¢ @ 2.45¢ for Steel Sheets; 80 % @ 80 and 2½ % off for Galvanized Sheets, 10 % off for Sheet Copper. Small lots are still selling at 2.40¢ @ 2.50¢ for No. 27 Common, and 75 and 10 % off for Galvanized.

Merchant Steel.—The only notable feature of this trade at present is the excellent stream of specifications coming in on season contracts. New business for the past week has been rather quiet. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.60¢ @ 1.70¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Wire Rods.—Negotiations are pending on Billets, but nothing of special interest has de-

veloped since last report. Quotations are continued at \$17. No movement has taken place in Wire rods, which continue to be quoted at \$23.50.

Old Rails and Wheels.—Consumers and dealers are a little in conflict regarding the exact condition of the Old Iron Rail market. Consumers allege that Rails have been sold as low as \$10.25, but dealers insist that the actual market price is nearer \$11. Negotiations are pending for delivery at Eastern points on the basis of \$11, Chicago, which is being firmly maintained by those who hold largest stocks here. Old Steel Rails are quoted at \$6 @ \$9, according to length and condition. The old Steel Street Rails, recently offered by one of the railroad companies here, have not yet been sold. Old Car Wheels are very plentiful, but holders seem unwilling to part with them except at about \$8.75 @ \$9.

Scrap.—With the close of the year approaching the trade in Old Material of this character has fallen off almost completely. Dealers who have made special efforts to move even small stocks have been unable to accomplish anything. Low prices have been no inducement. A much better business is expected in January. Sales are reported during the week as low as \$8 for No. 1 Wrought, but dealers' quotations are maintained as follows, per net ton: Railroad Forge, \$8.50 @ \$9; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.50; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.25 @ \$3.50; Wrought Turnings, \$5.25; Axle Turnings, \$6.25; Fish Plates, \$9 @ \$9.25; Horseshoes, \$3.25 @ \$3.50; Mixed Steel, gross ton, \$5; Heavy Melting Steel Scrap, \$6.

Metals.—Copper is top grade. Carload lots of Lake are now quoted at 10½¢ @ 10¾¢. Standard brands of Casting Copper are held firmly at 9¼¢, and while some less known Western brands may be bought slightly cheaper, they are held at higher prices than quoted last week. Spelter is in very limited demand, and still quoted at 3.15¢ @ 3.20¢ for prime Western brands. The Pig Lead refiners in this vicinity appear to be sold up better than those in other Western localities, and are asking 2.95¢ @ 2.97½¢, but brokers have offered Lead to consumers at 2.87½¢. The future is somewhat uncertain, but the impression prevails that Lead will be dearer unless the foreign market should recede.

Frank I. Foote, who has for many years been connected with Rogers, Brown & Co., now Rogers, Brown & Merwin, pig iron commission merchants, has severed his relations with that house and established an office in room 1210, Masonic Temple, Chicago, representing the Ashland Iron and Steel Company, manufacturers of the Hinkle brand of Lake Superior charcoal pig iron. Mr. Foote enjoys a wide acquaintance among the pig iron consumers of the Northwest, who will doubtless be pleased to give him a share of their patronage.

Recognizing the importance of Cleveland and the nearby territory as a Pig Iron market, Rogers, Brown & Co. of Cincinnati have decided to locate an agent there permanently. N. H. Ashley, well known to the central New York trade, formerly located at Buffalo, has taken an office in room No. 511 Perry-Payne Building.

Louisville.

LOUISVILLE, KY., December 15, 1894.

One week nearer the holidays shows a decided falling off in some lines of heavy goods, while in lighter and fancier wares, more suitable to the season of good fellowship and presents, a great rush of business is going on. The jobbers who find it dull are utilizing the time taking stock, so that after the advent of the New Year they will be prepared for what is hoped to be the beginning of good times. As time goes on, it is found that the cotton section is not in such a bad fix as was feared. The Southern staple is certainly very much demoralized in price, but the farmers raised a great deal more than cotton; a fine corn crop was harvested, and the probabilities are that a still larger one will be put in next year. Many hardware jobbers withdrew from this territory, but probably the largest manufacturer of plows for cotton cultivation advises that his factory has taken all the big orders he could secure, and after the holidays will go after the smaller ones. His faith is not shaken in the South, and he thinks the whole section all right.

Pig Iron.—The movement in Pig is very satisfactory, though small lots, carload orders and up to 50 tons, are about all that are going and these only for immediate use. We can note few sales of 1000 tons, one such lot having been booked as a working sample of a particular Southern Iron. The main order will probably be placed after thorough trial. At a recent letting of a contract, most of the prominent furnaces being represented, it was found that all of them felt firm enough to refuse to go below present prices, although a slight shade from any one would probably have taken the order. And, on the other hand, the buyer felt so confident of gaining concessions that the order was not placed. Perhaps he thought they had put up a combination against him. The truth is the furnaces held their representatives down to strict injunctions. Little effort will be made to make sales before January 1.

The following prices remain unchanged:

No. 1 Foundry, Southern	
Coke.....	\$9.75 @ \$10.25
No. 2 Foundry, Southern	
Coke.....	9.00 @ 9.50
No. 3 Foundry, Southern	
Coke.....	8.50 @ 9.00
Gray Forge.....	8.25 @ 8.75
Mottled.....	8.00 @ 8.50
No. 2, Soft.....	8.75 @ 9.25
Southern Car Wheel Iron.....	13.00 @ 17.00

There is hardly enough Hanging Rock and Lake Irons used to establish market prices, although certain mixtures require regular deliveries.

The editorial in the last issue of *The Iron Age* on "Warehouse Facilities in Large Cities" is causing considerable comment. The establishment of such depots by some of the big combinations will have the effect either of a monopoly, which they desire, or of competitors doing likewise, where they are strong enough. Some jobbers look with apprehension on such big stocks, although they are assured that their interests will be properly guarded and not interfered with. Sharp competition is raging in the staples of Barb Wire, plain Wire and Wire Nails, the more staid stocks of Bar Iron being held for better profits; fewer dealers handle them.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }
PITTSBURGH, December 18, 1894. }

When it is considered that the Iron trade is in the middle of the dulllest month in the year the volume of business offering can be said to be fairly large, but in any other season could not be so considered. Negotiations involving round lots of Pig Iron, Billets, certain kinds of Finished Material and Coke for delivery during the first quarter of the year, and in some cases up to July 1, are pending, and a number of transactions have been closed. The outlook for a material expansion in volume of business after the first of the year is bright, and with the above all has been said of an encouraging nature that can be said. Prices on Pig Iron Billets, Coke and Finished Material are as low or lower to-day than ever before in the history of the Iron trade. During the week Bessemer Pig has touched \$10.15, Pittsburgh, Rod Billets, \$15, while Coke for the first quarter of 1895 has sold at 90¢ per ton. It is not pleasant to be compelled to chronicle such low prices, but actual conditions ruling in the Iron trade demand it. It is the hope of everybody, whether buyer, seller or correspondent, that bottom has been reached and that an upward turn will soon come.

Pig Iron.—The Pig Iron market is unsatisfactory, both as regards demand and prices. While it is true that Coke, Ore and Limestone are cheaper to-day than ever before, yet at the same time it is also true that Pig Iron is being sold at the lowest prices ever reached in the history of the trade, so that the condition of the furnaceman is really as bad, if not worse, than it has ever been. With Bessemer Pig ruling at \$9.50 at Valley furnace, it is extremely doubtful if the furnaceman can come out whole, while there are those who insist that he is making Iron at a loss. The demand during the week has been quiet, but considerable Iron for delivery during the first three or four months of next year is under negotiation. Sales of moderate quantities of Gray Forge are being made on the basis of \$9.35 @ \$9.50 Pittsburgh. Foundry Iron is dull in demand and weak in price. Reports are going of sales of several round lots at extremely low figures. We quote as follows:

Neutral Gray Forge.....	\$9.35 @	\$9.50 Cash.
All-Ore Mill.....	9.50 @	9.65 "
No. 1 Foundry.....	\$11.00 @	11.25 "
No. 2 Foundry.....	10.50 @	10.65 "
Bessemer.....	10.15 @	10.25 "

We note a sale of 2000 tons of Bessemer at \$10.15, Pittsburgh, and one of 1000 tons at \$10.25, Pittsburgh. Also a sale of 800 tons of No. 3 Foundry Iron at \$10, Pittsburgh.

Billets.—During the week Billets have touched the lowest price ever known in the history of the trade, a sale of 8000 tons of Rod Billets having been made on the basis of \$15 at makers' mill, the deliveries being January, February, March and April. Other smaller lots have been sold at \$15.10, \$15.15 and \$15.25 at makers' mill. As noted last week, a local concern that has not appeared in the market as a seller for a considerable time has again entered the arena and is credited with three sales of round lots to Pittsburgh consumers. One of these lots is given as 30,000 tons, equal deliveries during the first six months of the new year. A number of Steel plants will close down for various periods before the close of the year for the usual annual repairs. The Steel market may be fairly quoted at \$15

and \$15.25 at makers' mill, the lower quotation being for Rod Billets and for round lots, with favorable terms of payment.

Steel Rails.—The local mill is credited with taking an order during the week for 5000 tons for a Western Road. We continue quotation of \$22, Pittsburgh, for 45 lb and upward.

Ferromanganese.—Foreign Ferro has been offered in this market at \$48.20, delivered at buyers' mill, and it is not improbable that domestic could be obtained at this price or slightly lower.

Structural Material.—Both local mills are reported as well equipped with orders, and considerable work is in prospect, making the outlook for the winter's operations very encouraging. As noted last week, prices are showing a firmer tone and we continue to quote Beams and Channels up to 15-inch, at 1.25¢ @ 1.35¢, according to order. Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.35¢.

Plates.—There is only a fair amount of work being offered, and competition among the mills continues very severe, some low prices being made. However, one or two concerns that are fairly well equipped with work are refusing to meet the market, and are about \$2 per ton higher in their prices than are being accepted by other concerns. The report that a local mill had secured an order for Plates for foreign shipment is not confirmed. We continue to quote Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

Merchant Steel.—Orders are picking up to some extent, a number of buyers having recently come into the market and placed orders to cover their requirements for the next two or three months. Prices, however, do not show any improvement, and we continue former quotations as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.40¢ @ 1.50¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢. These prices are occasionally shaded for desirable orders.

Muck Bars.—As noted last week, foreign brands of Muck Bars are being offered in this market at \$18, delivered at buyer's mill. Pittsburgh makers, however, continue to ask \$18.50, delivered.

Bars.—Last week showed some little improvement in operations of the mills, particularly in the Valley, where, it is reported, better time was made than has been the case for quite a period. The impression is general that after the first of the year the volume of business will materially increase, as customers are deferring purchases until after the turn of the year. There are practically no stocks in the hands of jobbers and consumers, and this fact leads to the belief that buying will be much more liberal when stock taking has been completed and books for the year have been closed up. While prices are very low, and in some cases are undoubtedly at cost, or a shade below, it is not thought that any further decline will come, and any change must be in the direction of an improvement. We continue to quote Common Iron Bars at 0.90¢ @ 0.95¢, and Soft Steel Bars at 1¢ @ 1.05¢, with the usual averages.

Skelp Iron and Steel.—There is only a moderate demand, and prices are showing a somewhat weaker tendency.

We continue quotations as follows: Grooved Steel Skelp, 1¢ @ 1.05¢, according to width and order; Sheared Steel Skelp, 1.10¢ @ 1.15¢; Grooved Iron Skelp, 1.15¢ @ 1.20¢; Sheared Iron Skelp, 1.25¢ @ 1.30¢.

Pipes and Tubes.—An inquiry is in the market for about 25 miles of 6-inch Line Pipe, and the contract for it is expected to be placed this week, or early next week. It is stated that it will be used for laying a gas line from the gas fields in Logan County, Ohio, to Circleville, Ohio. There is a fair demand for Pipes and Tubes, considering that this is the dulllest month of the year, but prices remain low, one concern in particular being credited with being very aggressive in this direction. The belief exists among makers that prices on Iron Pipe are about as low as they will go, and an improvement is anticipated after the first of the year.

Sheets.—Sales calling for immediate delivery are very light, but a number of contracts for delivery during the first quarter of 1895 are pending. While no material decline in prices has occurred, the tone of the market is weaker. We quote No. 27 Common Iron at 2.15¢ and No. 27 Steel at 2.25¢ for usual orders. For round lots our quotations would probably be slightly shaded. We quote Galvanized Sheets at 80 ¢ and 80 and 2½ ¢ off, according to order.

Wire Rods.—Some few sales are being made of small lots for close delivery and these are based on prices equal to about \$22, Pittsburgh. A local mill has recently made sales of several round lots and their capacity is pretty well disposed of for the next four months.

Wire Nails.—An improved demand is noted during the last week and the volume of business for this month is considerably heavier than for the corresponding month of last year. Makers anticipate slightly higher prices early in the new year, and in fact are declining to sell for any considerable period at present prices. We continue to quote Wire Nails for immediate delivery at 90¢, in carload lots, but, as noted above, for extended delivery slightly higher prices are asked. The demand for Cut Nails is very light, and one of the principal Wheeling mills has again closed down and is filling orders from stock. We quote Cut Nails at 80¢ @ 85¢ for usual averages.

Barb Wire.—As far as demand is concerned the situation is fairly satisfactory, but considerable complaint is heard on account of the very low prices that are ruling. For immediate delivery we quote Four-Point Galvanized at \$1.90 in carload lots. For delivery within the next two or three months an advance of from \$1 to \$2 per ton over this price is being asked. We continue to quote Plain Wire at \$1.20 @ \$1.25 in carload lots, for close delivery.

Iron and Steel Scrap.—Consumers are postponing purchases until after the first of the year, and as a result very little Scrap of any kind is moving. There is considerable irregularity in prices, these depending nearly altogether on the conditions surrounding the sale. We quote as follows: No. 1 R. R. Wrought Scrap, \$9.75 @ \$10, net ton; Railroad Cast Scrap, \$9, gross ton; Hammered Iron Car Axles, \$18 @ \$18.50, net ton; Rolled Iron Car Axles, \$15, net ton; Car Wheels, \$9 @ \$10, gross ton, according to quality; Old Iron Rails, \$12, gross ton; Old Steel Rails, 6 feet and over, \$11, gross ton; short or mixed lengths for melt-

ing stock are very dull, and are freely offered at \$9, gross ton; Cast Iron Boring, \$5, gross ton; Steel Leaf Springs, \$11.50, gross ton, and Steel Coil Springs \$10.50, gross ton. We note a sale of 200 tons of No. 1 Railroad Wrought Scrap at \$10 per net ton, for December delivery.

Connellsville Coke.—The tremendous production going on in Connellsville Coke for the past four or five months is given as the reason for the sharp decline in prices which has occurred during the week. Furnace Coke for the first three months of 1895 is being offered at 90 cents per net ton, and contracts for delivery during January, February and March have been made at that price. We quote Furnace Coke at 90 cents for January, February and March delivery and Foundry Coke at \$1.15, all in tons of 2000 pounds f. o. b. cars in Connellsville region.

Baackes & Co., Pittsburgh, Pa., advise us that their barb wire mill at Joliet, Ill., has been put on double turn, while their wire and wire nail mills at New Philadelphia, Ohio, which have heretofore been on single turn, have also been put on double turn. This concern reports large sales of wire and wire nails for delivery during the first quarter of the new year.

Cosgrove & Dillon of the Hamilton Building have been appointed agents for Western Pennsylvania of the Syracuse Smelting Works, manufacturers of Solder and Babbitt Metals, of Syracuse, Pa.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts. }
CINCINNATI, December 19, 1894. }

There has been an increased demand for Pig Iron during the week under review from large buyers, resulting in liberal sales, and there are still some large contracts pending. But while there has been more activity there has been a weaker feeling; at least there have been lower prices accepted to move round lots. The easier feeling prevailing, however, has been more conspicuous among the Northern stacks than among the Southern furnaces, and yet the fact remains that Southern Iron has been sold at lower prices delivered to consumers. It is stated, and the claim defended with some asperity, that the large Southern companies are not shading the prices established about two months ago, and the lower delivered prices are accounted for by reduction in freight rates, cuts in commission or different systems of grading. On the other hand it is asserted that furnaces have shaded previously current prices because of the desire to obtain relief from accumulated stocks of certain grades. This irregularity, however, is not a new feature, as it has existed for several weeks and is one of the ordinary phases often noted when the market is in a transitory stage. Outside of the Pipe works and a few other large foundries who have been free buyers there has been some disposition on the part of consumers to delay deliveries, and this fact has had a tendency to aggregate the accumulation of some grades and given rise to the disposition to shade prices on such lots. But wherever buyers have found a yielding market they have bought more liberally, the result being that the volume of business dur-

ing the week has been considerably increased. Pipe works have purchased from 2000 to 3000 tons and other large general foundries have bought 3000 to 4000 tons additional in 1000-ton lots. There have also been several sales of 500 to 600 ton lots, as well as an increased number of small purchases of both Northern and Southern make. It is noticeable, too, that in addition to the usual grades the orders have embraced a larger percentage of Softeners, Silvery Gray and Silvery Iron, as well as Charcoal Valley and Lake Ore Irons. The Iron distributed through Cincinnati will probably aggregate at least 10,000 tons, and at the moment the placing of another contract of 2000 to 3000 tons more is pending. It is stated that the Southern Pipe Works, which are melting heavily, are in the market for between 20,000 and 30,000 tons of Iron, but these contracts are usually placed direct with the furnaces. The fact, however, that large buyers are entering the market upon the heels of an already large consumption gives an improved tone to the market, making buyers freer purchasers and counteracting the influence of irregular prices. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$9.75 @	\$10.00
Southern Coke, No. 2.....	9.00 @	9.25
Southern Coke, No. 3.....	8.50 @	8.75
Ohio Soft Stone Coal, No. 1....	14.50 @	15.00
Ohio Soft Stone Coal, No. 2....	14.00 @	14.50
Lake Superior Coke, No. 1.....	11.75 @	12.25
Lake Superior Coke, No. 2....	10.75 @	11.50
Hanging Rock Charcoal, No. 1..	16.00 @	16.50
Hanging Rock Charcoal, No. 2..	15.50 @	16.00
Tennessee Charcoal, No. 1.....	13.00 @	13.50
Tennessee Charcoal, No. 2.....	12.00 @	12.50
Bessemer.....	11.85 @	12.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @	16.75
Lake Superior Car Wheel and Malleable.....	14.25 @	14.75

Forge.

Gray Forge.....	8.25 @	8.50
Mottled Coke.....	8.00 @	8.25

Miller, Wagoner & Bentley are a new firm at Columbus, who are selling Northern and Southern Foundry Irons, Bessemer Pig and Muck Bar.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*, }
Bank of Commerce Building, }
St. Louis, December 19, 1894. }

Pig Iron.—Transactions in Pig Iron have been unusually light during the past week. Inquiries are scarce and it requires persistent work to close sales. No. 2 Foundry is firmly held at \$7, f. o. b. Birmingham, notwithstanding the effort made in some quarters to create the impression that this price can be shaded. No large business is anticipated until after the turn of the year, and unless all signs fail a higher range of prices will prevail after the new year sets in. An objectionable feature of the market is the requests from consumers to hold off shipments, presumably to make a better showing when the annual inventories are taken. Sales during the past week are hardly worth recording. We quote as follows for cash, f. o. b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.50 @	\$10.75
Southern Coke, No. 2 Foundry.....	9.75 @	10.00
Southern Coke, No. 3 Foundry.....	9.25 @	9.50
Southern Car Wheel.....	16.50 @	17.00
Gray Forge.....	9.00 @	9.25
Ohio Softeners.....	14.00 @	14.50

Bar Iron.—There is no improvement to note in the demand. Mills are in hopes that some car orders will be placed early in the New Year and a revival of trade be thus brought about. Common Iron is quoted at 1.05¢ in shipments from mill. Jobbers ask 1.10¢ @ 1.15¢, according to quantity.

Barb Wire.—The demand is confined largely to small lots. Mills are not running full, and as the spring demand will not set in for some little time yet, no early improvement in this department is anticipated. Notwithstanding the several failures of manufacturers to come to some agreement regarding output, we understand that certain manufacturers have not as yet given up the idea, but are busily engaged at work on a plan which it is expected will prove satisfactory to all concerned. We quote Painted, \$1.60 @ \$1.65; Galvanized, \$2 @ \$2.05.

Wire Nails.—There have been some orders placed for delivery during the early part of next year, but aside from this the market is extremely quiet. Prices fail to show any improvement and \$1.10 @ \$1.15 continue to be jobbers' quotations.

Pig Lead.—The Lead market was treated to a little spurt late last week, but it failed to last any time. Sellers are now willing to accept orders at 2.85¢, but cannot find any buyers at this price.

Spelter.—The market has settled to 3.10¢, but even this low price does not interest buyers. There is practically no demand and consumers are not disposed to lay in a large stock so late in the year.

Metal Market.

Pig Tin.—Prices have almost steadily declined during the period under review. The "bear" interest, having the advantage as far as both sentiment and statistics are concerned, forced matters to greater or less extent. From the top prices reached last week a decline of about 0.50¢ per pound has taken place, or to about 13.70¢ for current month and a shade less for distant future deliveries. In speculative circles the turnover of contracts was large and involved 1,000 tons or more. The amount of actual tin that changed hands was doubtless much less, yet problematical. That there is enough to go around is very clear, and that future supplies will be abundant is evidenced in the advices of Straits shipments during the first half of the month. These aggregated 2540 tons, of which 1900 were destined to London, 120 to the United States and 520 to Continental Europe. Liberal deliveries to consumers have been made on former contracts, but new purchases have been moderate, although small lots were quite frequently quoted out at prices very close to those prevalent in the speculative line for 5 tons and larger quantities. Closing prices were on the basis of about 13.70¢ @ 13.75¢ net cash for round lots.

Copper.—There is no confirmation of a European report that the Anaconda Company have decided to reduce their output one-half during the coming year. Evidence is wanting also of anything in the nature of a general agreement among producers. That the output during the winter months will be below the average is very probable, however, and that fact, along with a firmer stand taken by the mining companies, has led to some further advance in prices. Quite a liberal business has been done with

home consumers, involving deliveries during the first quarter of the coming year. The price for Lake Ingot is understood to have been 10¢. That rate is now generally quoted by the producers, and on outside lots 9½¢ is the lowest quotation named. Electrolytic is quoted now at 9½¢. Liberal purchases were made recently at a fraction less. Common Casting Copper has improved to 9½¢ @ 9¼¢, and a good business has been done during the past week.

Lead.—Dealings have been on a somewhat more liberal scale, but at slightly lower prices. Probably 1000 tons were sold here for January and later delivery, at 3.10¢. There are sellers at that price now, and single carloads may be secured at 3.12½¢ for prompt delivery.

Spelter.—There has been no improvement in business or in the demand and the market shows rather poor form at the moment. Some speculative lots of common Western may be secured at 3.25¢ @ 3.30¢ for early delivery. At first hands 3.35¢ @ 3.40¢ is asked for reputable brands.

Antimony.—The market remains quiet, with prices steady at 7½¢ for Hallett's and 8½¢ for Cookson's, from store.

Tin Plates.—A somewhat larger business has been done, particularly in futures deliveries, and buying interest is better than it has been for some time past, although not particularly lively. In prices very little change has taken place. Spot quotations are as follows: Charcoal Tins: Melyn Grade, one-half X IC, \$4.75; IX, \$6.25; Lisvane, &c., IC, \$4.30; IX, \$5 12½; Al laway Grade, IC, \$4.20; IX, \$5; Siemens Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4.00 basis. Bessemer Steel, IC squares, &c., full weight, \$4.25 basis; 100 lb, \$3 95 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.00; 100 lb, \$3.65; 95 lb, \$3 57½; 90 lb \$3.50. Charcoal Ternes: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.50; IC 20 x 28, \$8 60; Allyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8; Allyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7 60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3 90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.80.

The monthly production of Copper in the United States has been as follows, according to John Stanton, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.			
	Reporting mines. Gross tons.	Outside sources. Gross tons.	Total. Gross tons.
Second half			
1892.....	58,239	6,287	65,526
First half			
1893.....	62,470	6,478	68,938
Second half			
1893.....	67,290	6,352	73,642
Totals			
1893 ..	129,760	12,730	142,480
1894.			
January...	10,832	1,340	12,172
February...	10,245	1,340	11,585
March.....	13,759	1,340	15,099
April.....	12,475	1,340	13,815
May.....	12,668	1,340	14,008
June.....	13,972	1,340	15,312
First half			
1894.....	73,951	8,040	81,991
July.....	12,639	1,340	13,979
August....	11,815	1,500	13,315

September. 11,257	1,500	12,757
October.... 12,692	1,500	14,192
November. 11,044	1,600	12,644

The product of the foreign reporting mines and the United States exports were as follows:

	Foreign reporting mines. Gross tons.	United States exports. Gross tons.
Second half 1892.....	39,655	17,980
First half 1893.....	41,048	20,361
Second half 1893.....	40,647	60,031
Totals 1893	81,495	80,392
1894.		
January	8,145	7,717
February.....	7,217	5,590
March.....	6,922	7,137
April.....	7,385	6,209
May.....	8,013	6,140
June.....	7,611	6,976
First half 1894.....	45,293	39,769
July.....	6,960	7,226
August.....	7,367	6,408
September.....	7,110	7,093
October.....	7,231	5,057
November.....	6,964	4,785

Robert Crooks & Co. have removed from 64 John street to 138 Front street, corner of Pine street.

New York.

Office of The Iron Age, 96-102 Reade street,
New York, December 19, 1894.

Pig Iron.—The week has been uneventful, there having been no sales of magnitude. Consumption in this section continues light, and occasionally a demand is even made to delay deliveries. We quote \$12 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2, and \$10.50 @ \$11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at \$11.25 @ \$11.50 for No. 1; \$10.25 @ \$11 for No. 2; \$10 @ \$10.50 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.50 @ \$10.

Cast Iron Pipe.—A lot of about 550 tons of pipe has been sold by a Northern shop, for delivery at New Bedford, at \$19.65. An interesting contract is coming up at Cambridge, Mass., where alternate bids are called for on either 5500 tons of Cast Iron Pipe under one plan, or on 2200 tons of Cast Iron Pipe and 15,000 feet of Riveted Steel Pipe under a second plan. It will serve to indicate how, relatively, Cast Iron and Steel Pipe stand at present prices.

Ferromanganese and Spiegeleisen.—In the absence of business we quote nominally \$46.50 @ \$48 for 80 % Ferromanganese and \$20 @ \$20.50 for 20 % Spiegeleisen, tidewater.

Billets and Rods.—The market is weaker on Billets under the influence of the Western markets. We quote nominally \$17.50 @ \$18 for domestic Billets and \$24.25 @ \$24.50 for Wire Rods, tidewater.

Steel Rails.—The market is very quiet, no sales of any consequence having been made. There has been some question as to whether Foreign Rails could get into the Pacific Coast market at present prices on both sides of the Atlantic, the Southern Pacific being in the market for an additional quantity. We are advised that domestic Rails can be laid down a shade under the foreign price, in spite of more favorable ocean freights, the rate on American being \$6 per ton. We continue to quote \$22.75, tidewater, for standard Rails and \$24 for Girder Rails.

Track Material.—We quote as follows: Spikes, 1.40¢ @ 1.60¢; Fish

Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 1.80¢ @ 1.90¢, and Hexagon Nuts, 1.90¢ @ 2¢, delivered.

Manufactured Iron and Steel.—No contracts of any magnitude have been placed in this market during the past week. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.20¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.50¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.10¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.10¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.25¢ @ 1.50¢, delivered; Steel Axles, 1.25¢ @ 1.50¢, and Links and Pins, 1.35¢ @ 1.50¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.30¢ @ 1.85¢, and Spring, 1.65¢ @ 1.70¢, delivered.

Financial.

The discussion by Congress of the currency question and a continued gold export movement of large volume, with a rapid shrinkage in the Treasury reserve of the precious metal from this and other causes, have combined to exercise a depressing influence on trade and speculation during the week under review. In ordinary times the closing weeks of the year, bringing, as they do, the usual holiday dullness and a contraction in business preparatory to the adjustment of annual accounts, are marked by a falling off in activity; and this year has provided no exception to the general rule. The circumstances before mentioned tend, however, to furnish an additional streak of dullness and discouragement, and are sufficient of themselves to exert an unfavorable influence on business. While it is believed by many that the Carlisle banking bill may pass the House, it is not thought likely that the Senate will themselves rush through a measure involving so radical a change in our currency arrangements, but will bestow an extended consideration on the question in all its bearings. Nevertheless, the uncertainty caused by its discussion at this juncture is not calculated to promote the confidence necessary to any great and immediate improvement in the general business of the country.

About \$5,330,000 in gold has been the extent of the shipments to Europe since our last report, of which \$3,580,000 was sent to Paris by last Saturday's steamer, and \$1,750,000 to Germany on Tuesday. As the foreign exchanges now stand it is almost certain that further substantial shipments will be made at the close of the week. All this gold has been drawn from the Sub-Treasury, and has assisted in bringing down the Government reserve of the metal very materially. The actual figures of the Treasury gold reserve on Tuesday evening were \$91,554,900, showing a loss of more than \$18,000,000 since it was replenished by the payments for the bond issue. This rapid dwindling of the reserve is, of course, only partially accounted for by the foreign demand. About two-thirds is due to withdrawals by domestic note holders. Meanwhile the Treasury is receiving almost nothing in the way of gold coin to balance this loss from customs and in-

ternal revenue; and if the present rate of decrease is kept up, a further issue of bonds may become a necessity early in the coming year.

In all other respects the existing conditions favor an improvement in business. The volume of domestic trade and commerce in the first two weeks of this month shows an increase over that of last year at the same time. The *Financial Chronicle's* tables of bank clearings for the week ended December 15 show a gain of 18.3% for New York, and of 9½% for all cities, as compared with the corresponding week of last year. Still they fall 22% below the figures for 1892. *Dun's Review* prints a summary of reports from some thousands of employers all over the country, which shows that in the establishments at work the wages of labor average *per capita* 10.75% less than two years ago, but about 5% more than last year.

Railroad earnings, while still showing a loss as compared with last year, make a comparatively better exhibition than they did a month or two ago, and each week's reports are more favorable than those of the previous one. Thus of 134 roads reporting to the *Chronicle* for November the loss was less in the second week of the month than in the first, while the third and fourth weeks showed small increases. Compared with November, 1893, the net losses in earnings of these roads aggregated 1.58 above those of November, 1893. October, however, showed a loss of 5.59% and September of 6.22%. For the first week of December there was an increase of about 3.2% in earnings over those of last year.

The repeal of the anti pooling clause of the Inter-State Commerce law, which passed the House last week, and the prospects for its passage through the Senate, exercised a favorable effect on the stock market early in the week under review. This was followed, however, by a reaction in the opening days of the current week, owing to the depression induced by gold exports and the discussion of the currency question, and the market relapsed into its normal condition of ante-holiday dullness. Enormous trading in sugar certificates, aggregating nearly 200,000 shares in one day—Thursday—was the only business of any magnitude transacted in stocks during the week. Other issues generally have been quiet and heavy, and the trading of an exclusively "professional" complexion. Rock Island lost ground on Friday on the declaration of a ½% dividend by the directors in place of the 1% looked for. Altogether, the volume of dealings, inclusive of the large trading in sugar stocks, fell off some 200,000 shares for the week ended Saturday, as compared with the previous week.

During the current week the market has been an extremely narrow one, with some slight declines in values, the grangers being notably depressed. The earnings of the St. Paul road for the second week in December, showing a slight percentage of loss as compared with last year, were regarded as unfavorable, as last year's returns for the same week were much below the average for this crop-moving season. St. Paul stocks suffered accordingly, particularly as some considerable London selling of these issues was reported. The market closed flat on Wednesday.

Railroad bonds have been quiet and somewhat weaker in tone. Government bonds have suffered from the dwindling in the gold reserve and the talk of another bond issue. Last week a small lot of the new 5's sold at 118¾, although the nominal price is main-

tained at 119½, and a smart decline in both the 4's and 5's has taken place during the current week. Closing prices on Wednesday were as follows:

	Bid.	Asked.
2's, 1891, regular.....	97
4's, regular.....	114	114½
4's, coupon.....	115½	115½
5's, regular.....	118½	118½
5's, coupon.....	118½	118½

Money still comes to New York from the interior in large amounts, but the demand for loans shows but small indications of improvement. Money on call rules at 1% @ 2%, the average being 1½%. Time money is slightly firmer, owing to the belief of lenders that better prices will be obtainable after the first of the year. It is still far from active, however. Rates are unchanged, being quoted at 1½% for 30 days; 2% for 60 to 90 days, 2½% for 4 months, and 3% @ 3½% for longer periods.

Mercantile paper is fairly active. A larger volume of good material is in the market, but buyers are not so numerous owing to the temporary employment of their funds in other directions. Rates are: 3% for 60 to 90 days' indorsements; 3½% @ 4% for high-grade single names, and 4½% and upward for others.

The market for sterling has been dull, the demand for and supply of bills being light. Rates were "shaded" on Wednesday in some instances, but otherwise the market was held fairly steady up to the close. Actual business was done as follows: \$4.87½ for 60 days, \$4.88½ for demand, \$4.88½ for cables, and \$4.86½ @ \$4.86½ for commercial. Domestic exchange on New York was quoted as follows: Chicago, 75¢ premium; Boston, 10¢ discount; Savannah, buying ½ discount, selling par; Charleston, buying par, selling ½ premium; San Francisco, sight 10, telegraph 12½; New Orleans, commercial 100 discount, bank par.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, December 19, 1894.

In the market for Pig Tin there has been a sharp reaction, and prices are now about £2 5/ lower than they were a week ago. The firmness brought about early in the week by bull purchases and covering of short accounts gave way to weakness, due to realizations by holders, cessation of demand, heavier shipments from the East than were expected and increase in stocks. Straits shipments during the first half of the month were 2540 tons. The market to-day was: Late sales at £61.17/6 for prompts and £61.15/ @ £61.17/6 for three months' futures.

Copper declined on realizations, going to £40. 10/ for Merchant Bar prompts, chiefly under the influence of "bear" sales. Subsequently there was some improvement after slight variations, with fair inquiry, chiefly for near positions. European stocks, as reported, have decreased 369 tons during the past fortnight, but the visible supply has increased 381 tons. Chili charters were 1400 tons. At the close Merchant Bars were quoted at £41. 5/ for prompts and £41. 12/6 for three months' futures. Best selected English is £43. 10/.

Tin Plate has been rather dull, and the market is weakish at last week's prices. There is a fair inquiry for forward deliveries, but buyers' offers are so much below makers' views that the makers prefer to wait. Stocks at shipping points are increasing in the face of quite heavy outward movement. The Blaina works will stop on Saturday indefinitely, pending better prices and settlement of the labor question. Several other works are likely to follow. Sellers' quotations at Swansea are as follows:

Bessemer Cokes, IC 14 x 20.....	9/6 @ 9/9
Siemens Cokes, IC 14 x 20.....	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20.....
Ternes, 20 x 28.....	18/6 @ 21/
Charcoals, IC 14 x 20.....	10/6 @ 12/6

Pig Lead has been in only moderate demand, but prices have remained quite steady at £9. 10/ @ £9. 12/6 for soft Spanish.

Spelter is in only fair demand, and prices are barely steady on the basis of £14. 10/ @ £14. 12/16 for ordinary Silesian.

Pig Iron warrants have ruled lower and the market is weak, with but little doing. Late dealings were at 41/8 @ 41/9 for Scotch, 34/10½ @ 35/ for Cleveland and 43/3 @ 43/6 for Hematite.

Birmingham.

BIRMINGHAM, ALA., December 17, 1894.

Pig Iron.—Sales are lighter in most cases, and few as high as 1000 tons. Most are for small lots and prompt delivery. The demand for Foundry grades is very good, as is evidenced by the lack of large orders, which are generally for the lower grades, while Foundry grades more generally go off in smaller lots. The demand for Gray Forge is light. There is little demand this week for long time sales, and no disposition to encourage such demand. The market is very quiet, and the feeling North seems weaker, while no further weakening has been noticed here. Stocks have increased but slightly this week, and in one case an accumulation of low grade Iron of over 1200 tons is held for shipment in bulk. The Chicago market seems to exhibit the strongest feeling of all Northern markets, and considerable interest is manifested here as to the ability to hold this market to its present figures.

In the Metal trade Tin has again declined under heavy speculative transactions. There have been round sales at 10¢ for Lake Copper, to consumers, for the first quarter of 1895. The story that the Anaconda Company had agreed to moderate its pace to the rate of production of the Calumet and Hecla is denied. Lead has been more active than for some time past.

Eugene V. Debs and his American Railway Union associates, who were sentenced to imprisonment last week by Judge Woods, of the United States Circuit Court, have decided to push the appeal of their case. They will begin to serve their terms in the Cook County jail, at Chicago, on Monday.

The open hearth plant of the Pencoyd Iron Works at Pencoyd, Pa., is being developed largely. When completed the works will have eight large modern furnaces.

HARDWARE.

Condition of Trade.

THE TRADE is beginning to feel more decidedly the effect of the near approach of the holiday season and the end of the year. Manufacturers are therefore intermitting for a little their efforts to secure trade, their representatives being for the most part withdrawn from the road and their own activity devoted to the closing up of the year's annual inventory. Some of the representatives of the jobbing houses are still on the road, but most of them will be home by the end of the present week. Retailers who carry goods suited to the holiday trade are occupied principally on these lines, but winter goods come in also for a fair share of attention. The moderate weather which has prevailed in many parts of the country has, however, had the effect of diminishing somewhat the movement of this class of goods. In the matter of prices there is little new to report, the market continuing to be characterized by a tone which is rather weak; but connected with this condition there have been few declines and in some lines a slightly better feeling is perceptible. The unsatisfactory condition of the Iron market does not tend to strengthen the tone of Hardware products, but the possibility of a better state of things, owing to higher prices of ore, is deserving the attention of such members of the trade as are watching closely the course of things influencing the cost of goods.

Chicago.

(By Telegraph.)

Some of the Shelf Hardware jobbers report a slight diminution in orders, but others state that their volume of business is fully as large as it has been. Much trouble is being experienced by some houses in taking their inventory, on account of the continued influx of good business. The metal trade is particularly active. Tin Plates, Galvanized Iron and all sorts of metal products are moving out quite freely. Seasonable goods are also in excellent demand. The holiday trade keeps up remarkably

well. Salesmen have not yet come in from the road, but next week will see them arriving from all quarters, and it is expected that the Hardware business will then be practically ended for this year. Considerable interest is being taken in the matter of price revision, which usually occurs before salesmen are started out again, but of course it is not known yet as to what the nature of this revision may be. A few lines will undoubtedly show a little stiffening owing to the better working of combinations, while perhaps other lines may show a slightly lower tendency on account of the weakening in staple goods. The Heavy Hardware trade has experienced an improvement during the past week owing to an increased demand from manufacturing consumers. The volume of business is such now that if added to this there had come the usual demand for season goods, such as sleigh material, the Heavy Hardware trade would have been classed as most excellent. The importers of Tin Plates have recently named extremely low prices here on lots for importation. The foreign manufacturers are doing their utmost to retain this market. Tin Plate freights from Swansea to Western points are as low as ever, notwithstanding the recent published withdrawal of through freight quotations by transportation companies. The domestic makers, however, are getting their works in full operation again and the result of the contest will hardly leave the foreign Tin Plates in possession of the field.

St. Louis.

(By Telegraph.)

The jobbing trade report a falling off in the demand for staple goods and a decided increase in holiday goods and novelties. Retailers are averse to stocking up at this time of the year, and as many of the traveling men are returning home for the holidays the demand from the country trade is sure to be limited. Prices do not improve and in some lines there seems to be no bottom. In the way of Galvanized Iron, Tin Plate and Tinnings Supplies a good trade is reported. Manufacturers are offering inducements in the way of low prices and late deliveries to keep their plants running through the winter months, but the effect of these prices is certain to be felt when the spring trade opens. The jobbing trade are all anxious to close up the year's business and begin in 1895, as the indications point to a better trade all around than has been enjoyed during the year now drawing to a close. Collections are fair.

Boston.

BIGELOW & DOWSE COMPANY.—Mild and summer like weather for the past week has had a depressing effect on the sale of Sleds, Skates, &c. Early ice gave the Skates a great boom, and customers are now replenishing stocks preparatory to a good Christmas trade. If, as is predicted, a cold wave is coming, a brisk trade for one week will deplete stocks and satisfy every one.

General business is well up to last year, but there are few who are placing many orders for spring delivery. There are some inquiries for prices on Wire and Wire Nails, but few orders are being placed. The market is weak and prices are lower. Conservative buyers are waiting. Labor is well employed, and after the laborer has paid his debts—incurred during his forced idleness—he will be more free to purchase something besides the mere necessities of life.

It is safe to say that stocks of merchandise invoiced at present prices would not suffer the shrinkage in value in '95 that they have in '94. A conservative estimate places the decline in '94 at from 5 to 20 per cent. Everything suggests an improvement in the near future, but the sad experiences of the past few years has made every thinking man study the causes and seek for ways and means to bring it about. This was self evident to every one who attended the first meeting of the National Hardware Association at Cleveland the past week. The trade showed a disposition to do away with petty jealousies and to work together for the common good. Meeting together as strangers they parted as friends. Surely such meetings can but promote the good of the Hardware trade. The Cleveland Hardware merchants are deserving high credit for conceiving and for their aid in the formation of this national association, and the manufacturers of Cleveland will not soon be forgotten for their many kind attentions.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade during the last two weeks has been fair in volume, and thus far it has proven quite a satisfactory month. The number of orders have been far in excess of one year ago, and with decreased values and the fact that specifications may have been for smaller quantities than in some other seasons, the chances are that the total sales for the month will be satisfactory to the extent of being far in excess of last year, and possibly almost equal to the year before.

It is now, however, the season for salesmen to withdraw from their travels for the balance of the year, and the force at home are preparing for the annual stock-taking. The task of taking an inventory is one not relished by either the jobber or the retailer, but all successful houses feel, and indeed know, that it must be met each year.

Stock clerks are now preparing their

shelves that working may begin with as much rapidity as correctness in performance of the duty will justify.

With this systematizing in all departments before beginning stock-taking, the largest jobber now takes rarely over ten days after he once begins.

The detail work of the buyer, or those who have charge of the pricing department, is a more serious matter each year, owing to the addition of new lines of goods, increased variety of makes, and a more general assortment of patterns, styles and sizes, so that the work of stock-taking can be classed as far from a pleasant one.

Changes in prices during the past few weeks have been of considerable note. Prices on many seasonal goods for spring wants will vary little, if any, from those in existence during the spring months of 1894. Such goods as are most directly affected by the market rates of raw material have suffered somewhat of late, more noticeable being the existing low prices on Wire of all descriptions and on Wire and Cut Nails, all these lines having touched a low notch, not reached even during the greater depression of the fall of 1893 and spring of 1894.

Predictions as to whether changes upward or downward are likely to occur in these staples are practically impossible to make, notwithstanding the expressed feelings of the manufacturers that figures have reached low water mark.

Baltimore.

CARLIN & FULTON.—During the last two weeks orders have been fairly numerous for goods needed quickly and appropriate to the season, but in size they are seldom large. This can partly be accounted for by the fact that we are near the end of the year, when many take inventory of stock, cast up their accounts and are averse to buying largely before the new year. We are also of the impression that trade would be better in our more immediate neighborhood were the weather somewhat cooler.

While in our Southern market the continued low price of cotton is disappointing, especially in view of the undoubted statements that it cannot be produced to afford any profit at present figures, we must remember that though this immense crop has probably afforded the planter no returns for his investment, yet the millions spent for gathering it have gone into hands that must spend the wages received, and in that way the money circulates, the storekeeper gets it, and in fact the farm hand has probably spent it before it has been earned. We think the experience of most houses is that their remittances as a general thing cannot be complained of, and there has never yet been a time in the history of trade that, no matter how prosperous the country, some did not ask for credit to be extended, that some did not fail, and that in some cases incapacity and in others rascality did not develop.

Trade during the past year has been undoubtedly poor, but what has been done has in most cases been safely done, and the conditions are such that when Congress shall have decided upon a satisfactory plan for national finances, and the country realizes the fact that prices have reached their lowest figures and manufacturers shall stimulate trade by enhancing the values of goods instead of depreciating them by unnecessary reductions, we shall see a turn for the better, and that probably at no distant day.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—In a general way it may be said of the operations carried on by the Jobbing Hardware Trade of this market during the first half of December, that trade was of a featureless character and devoid of any important incidents of general interest. Considering the conditions, the volume of business may be reported as satisfactory.

For a year and a half the country dealers have been ordering goods simply from hand to mouth, not overbuying in any instance, and certainly not anticipating their wants to the smallest extent. This policy produces numberless mail orders. Never were orders of this kind more numerous, and they are received with satisfaction, because no expense is attached toward securing them, and what profit there is in them is all clear.

Reports from the east indicate considerable improvement in the commercial conditions, and the most conservative now agree that the date for a marked recovery in trade is not far distant.

In this section, owing to the severe drought of last summer, it is to be expected that trade conditions will remain somewhat unsatisfactory, until prospects for a good crop stimulate people to purchase in anticipation of harvest.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—We are along in the last month of the year and still trade holds up pretty well. Our remarkably fine fall came to a rather sudden ending the past week and we have had two or three days of good old-fashioned Oregon rain. We may now expect very little clear sky until spring.

Collections are fair; not what they ought to be by any means, but dealers are, so far as we can judge, unusually active in gathering in their outstandings this year.

Stocks are, of course, low at this season, but if we can judge from the fact that one clipper has already sailed from New York with full cargo, and another is rapidly filling up for this port, there will be no lack of goods for the coming spring trade.

Louisville.

W. B. BELKNAP & CO.—We can report a good business for December. In fact, indications are much better now than they were in November, the result of which was a disappointment to the trade at large.

Christmas Goods are moving in fair quantities and retailers in our own city pronounce the season a success. While there is no extravagant purchasing there is a widespread demand for moderate priced goods, which indicates reasonable prosperity.

Values are still being adjusted to a lower basis in some instances, and in all organizations there is an effort to increase labor and money saving appliances.

We shall start '95 with a hopeful feeling, with the assurance that the shrinkage that we have had to suffer the last two or three years must necessarily be at or near its end. If we evolve a good financial scheme out of the various ones proposed, so that there shall be a feeling of stability and confidence in our currency, we may safely count on prosperity. There would be

little use in our attempting to undertake what the great commercial nations of the world do not agree to.

Fine weather has contributed to business for constructive and out of door supplies for immediate consumption.

We were greatly pained on Tuesday of this week to receive news of the death of James Larmon, president of the Cincinnati Barbed Wire Fence Company. Popular, warm hearted, generous as he was, he had a host of friends, business and personal. The institution which he built up from small beginnings is a monument to his unflagging energy and wise administration.

Cleveland.

THE W. BINGHAM COMPANY.—The first half of December has shown a very satisfactory increase in business over that of last year, and is better in proportion than November. There is a large demand for Wire and Nails, both for immediate and future shipment, but notwithstanding this the prices have shown weakness. Orders for agricultural goods for spring are coming in fairly well. The trade for holiday goods has been better than usual this season, Skates particularly being in very large demand. We consider the outlook for next spring's business excellent, and while we do not look for many changes in prices we think there will be a firmness after the season opens that is not apparent now. The city retailers report a good business, builders' Hardware being especially in demand. Collections are fair.

New Orleans.

A. BALDWIN & CO.—There is a somewhat better feeling prevalent and business has improved slightly during the past week. Orders are coming in more freely and a little larger in volume than they have been for some time. The bulk of the articles, of course, are seasonal goods, but Hardware in the heavy line also shows a slight improvement. To a certain degree most of the buyers seem to be holding off for the new year. The indications are that there will be a decided improvement after the next few weeks. Low prices do not seem to be any special inducement for buyers to increase their stocks to any great extent.

Notes on Prices.

Wire Nails.—The market for Wire Nails shows but little change since our last report. There is a good deal of inquiry and a fair volume of business. The mills, however, are not as full of orders as they would like to be, as they are desirous of having enough on their books to occupy them during the next month or two. Some of the large buyers, however, notwithstanding the low prices current, are disposed to hold off, apparently not being apprehensive of an early rise in values. Most of the orders which are placed are to supply current demands, and in many cases they indicate that the stock in merchants' hands is light. This is unquestionably the policy which the trade are disposed to pursue. The market is represented by the quotation of 85 to 90 cents on carload lots at mill, the former figure being readily obtainable on round lots at the usual average. There are rumors that this figure has

been slightly shaded, but manufacturers are certainly unwilling to make concessions from it as freely as a week or two ago. In this respect the market appears to be in a slightly better state. Small lots from store in New York are held at \$1.15 to \$1.20.

Chicago, by Telegraph.—The local trade appears to be almost entirely in the hands of local manufacturers. They have booked heavy orders for delivery during the first three months of next year, and jobbers are now quoting their customers for future delivery on the basis of present prices. Outside manufacturers are asking somewhat higher prices for Western business than those prevailing in this immediate vicinity. They say that their inquiries have latterly been improving, and their business from other sections is steadily growing larger. The demand from jobbers for mixed carloads of Barb Wire and Wire Nails has recently been quite heavy. Quotations are continued at \$1.10 for small lots from stock and \$1.05 for small lots from factory, and \$1 for carloads or mixed carloads of Wire Nails and Barb Wire shipped direct from factory.

Cut Nails.—The condition of the Cut Nail market is similar to that of Wire Nails, the current business being limited to the early requirements of the trade. There is little change in the matter of prices, which are represented by the quotation of 75 to 80 cents at mill on carload lots, 60-cent average. Carload lots on dock, New York, are held at 85 to 90 cents, and small lots from store at 90 to 95 cents.

Chicago, by Telegraph.—This branch of the trade continues in precisely the same condition as reported for several months. Orders are small, but continue to be received with regularity. Quotations are unchanged at 95 cents to \$1, Chicago, on factory lots, or 50 to 55 cents average. Small lots from stock are quoted at \$1.

Barb Wire.—There is, considering the advanced stage of the season, a fair business doing in Barb Wire, with little change in current quotations or in the general tone of the market. The quotation of \$1.85 to \$1.90 for Four-Point Galvanized in carload lots at mill still represents the market, but concessions are made in special cases.

Chicago, by Telegraph.—Manufacturers report a much larger trade, especially on the higher grades of Barb Wire. These grades have been in remarkable demand, considering the difference in price as compared with standard Wire. Manufacturers of the latter have also been able to secure a great deal of business, and their output is practically covered for at least the first three months of next year. Quotations are continued at \$2.10 for small lots of Galvanized from stock, \$2.05 for small lots from factory, and \$2 for carloads or mixed carloads of Barb Wire and Wire Nails. Sev-

eral large transactions have recently occurred on Plain Wire for delivery during the early months of next year. The character of these transactions is such as to indicate that some of the shrewdest buyers now believe that the market has touched its lowest point.

Carriage Bolts.—There has been little change in the market for Common Carriage Bolts during the past week or two, but prices have been more evenly maintained than previous to the conference of manufacturers to which we have referred. The effort made to check the downward tendency was apparently attended with a good measure of success, though there are intimations of some irregularities. Another conference between the manufacturers was held last week in Cleveland, at which action was taken advancing the extreme price at which the manufacturers sell the goods about 2½ per cent.

Cordage.—As usual at this season there is very little doing, and the market is sluggish and quotations are to a large extent nominal. The market is also without strength and ruling prices are more or less freely shaded. The market is represented by the following quotations, which are subject only to the discount of 1½ per cent. for cash, terms f.o.b. factory or New York:

	Cents per lb.
Manila, 7-16 in base.....	7¼ to 7½
Sisal, 7-16 in base.....	4¼ to 4½
New Zealand, 7-16 in base.....	4¼ to 4½

Scythe Snaths.—The Wood Goods market is in a very unsatisfactory condition, and the prices for Snaths and Cradles are irregular and somewhat demoralized. From the manufacturers' standpoint the outlook for next season is not encouraging. Prices are lower than they have ever been. There is apparently no concert of action between the manufacturers, and competition is active. Notwithstanding the low prices that are current the large trade are slow in placing orders, many of them apparently holding off until after the first of the year.

National Hardware Association.

ONE of the largest and most representative gatherings of the wholesale Hardware houses of the United States was held last week at Cleveland, a city which occupies an important position both in the manufacture and distribution of Hardware, and on this occasion became, for the time being at least, the Hardware center of the country. The coming together of the representatives of these houses was at the invitation of the wholesale Hardware dealers of Cleveland, the object of the meeting being to consider the advisability of forming a National Hardware Jobbers' Association, and if desirable to take steps in that direction. In accordance with this invitation the following houses, which represent, it will be observed, many leading firms, assembled on Thursday morning at the Hollenden:

WITTE HARDWARE COMPANY,
St. Louis, Mo.
A. F. SHAPLEIGH HARDWARE COMPANY,
St. Louis, Mo.
SMITH BROS. HARDWARE COMPANY,
Columbus, Ohio.
WRIGHT, DANA & Co.,
Utica, N. Y.
WEED & Co.,
Buffalo, N. Y.
BARKER, ROSE & GRAY,
Elmira, N. Y.
LANGSTAFF HARDWARE COMPANY,
Memphis, Tenn.
KING HARDWARE COMPANY,
Atlanta, Ga.
HAMILTON & MATHEWS,
Rochester, N. Y.
WALBRIDGE & Co.,
Buffalo, N. Y.
BINDLEY HARDWARE COMPANY,
Pittsburgh, Pa.
LOGAN, GREGG & Co.,
Pittsburgh, Pa.
OTT BROS. & Co.,
Wheeling, W. Va.
MORLEY BROS.,
Saginaw, Mich.
C. W. HACKETT HARDWARE COMPANY,
St. Paul, Minn.
SCHREIBER, CONCHAR & WESTPHAL COMPANY,
Dubuque, Iowa.
C. M. MCCLUNG & Co.,
Knoxville, Tenn.

GEO. BROWN,
Knoxville, Tenn.
ISAAC WALKER HARDWARE COMPANY,
Peoria, Ill.
JOHNSON BROS. HARDWARE COMPANY,
Cincinnati, Ohio.
HOWELL, GANO & Co.,
Cincinnati, Ohio.
KRUSE & BAHLMAN HARDWARE COMPANY,
Cincinnati, Ohio.
ALBANY HARDWARE & IRON COMPANY,
Albany, N. Y.
SUPPLEE HARDWARE COMPANY,
Philadelphia, Pa.
SHIELDS & Bro.,
Philadelphia, Pa.
BURHANS & BLACK COMPANY,
Syracuse, N. Y.
BUEHLER BONBRIGHT COMPANY,
Philadelphia, Pa.
WYETH HARDWARE AND MFG. COMPANY,
St. Joseph, Mo.
LEE, CLARKE, ANDRESEN HARDWARE COMPANY,
Omaha, Neb.
BOSTWICK-BRAUN COMPANY,
Toledo, Ohio.
FREEMAN, DELAMATER & Co.,
Detroit, Mich.
STANDART BROS.,
Detroit, Mich.
STOLLBERG & CLAPP COMPANY,
Toledo, Ohio.
W. B. BELKNAP & Co.,
Louisville, Ky.
MARKLEY, ALLING & Co.,
Chicago, Ill.
STAUFFER, ESHLEMAN & Co.,
New Orleans, La.
WILLIAM FRANKFURTH HARDWARE COMPANY,
Milwaukee, Wis.
JOHN PRITZLAFF HARDWARE COMPANY,
Milwaukee, Wis.
J. M. WARREN & Co.,
Troy, N. Y.
RECTOR & WILHELMY COMPANY,
Omaha, Neb.
WELLS & NELLEGAR COMPANY,
Chicago, Ill.
BIGELOW & DOWSE COMPANY,
Boston, Mass.
WILLIAM BINGHAM COMPANY,
Cleveland, Ohio.
GEORGE WORTHINGTON COMPANY,
Cleveland, Ohio.
LOCKWOOD-TAYLOR HARDWARE COMPANY,
Cleveland, Ohio.
H. W. LUETKEMEYER & SONS,
Cleveland, Ohio.
MCINTOSH HUNTINGTON COMPANY,
Cleveland, Ohio.
The meeting was organized by the

election of William W. Supplee of Philadelphia as temporary chairman and W. H. Coles of Cleveland as temporary secretary. The election of these officers was followed by the reading of papers designed to show the feasibility and advisability of forming a national association having for its object the protection of the interests of the trade. Some discussion then ensued, and it was decided unanimously to form such an organization. The following committee was appointed to report a constitution: H. S. Blossom of Cleveland, S. A. Bigelow of Boston, Frank Shapleigh of St. Louis, A. D. Langstaff of Memphis, W. S. Wright of Omaha and John Alling of Chicago. At the afternoon session the constitution reported was carefully considered and after minor amendments was adopted. In the transaction of this business there was a good deal of discussion, which was characterized by the best of feeling, the members evidently enjoying the fraternal relations into which they were thus brought.

Thursday evening was devoted to the banquet tendered by the Hardware manufacturers of Cleveland, an account of which is given in the following columns.

In accordance with the provisions of the constitution adopted by the association its officers shall be a president, two vice-presidents, a secretary-treasurer and an executive committee, of which the president of the association shall be *ex-officio* chairman. When the association met on Friday morning the following persons were elected, in accordance with the recommendation of the Committee on Nominations:

President,

WILLIAM W. SUPPLEE, Philadelphia.

First Vice-President,

JOHN ALLING, Chicago.

Second Vice-President,

A. D. LANGSTAFF, Memphis.

Executive Committee,

S. A. BIGELOW, Boston.
H. H. BISHOP, Cleveland.
FRANK SHAPLEIGH, St. Louis.
FREDERICK BARKER, Elmira.
W. P. SMITH, Knoxville.
F. C. PRITZLAFF, Milwaukee.

After deciding upon Pittsburgh as the place of meeting on the third Wednesday of November, 1895, the association adjourned with mutual congratulations on the success of the meeting and the prospect for the further cultivation of fraternal relations in the future.

The Banquet.

On Thursday evening an elaborate banquet was given by the manufacturers of Cleveland to the visiting jobbers and invited guests. The hospitality thus shown by the manufacturers of the city was greatly appreciated by the visitors, and added not a little to the cordial and fraternal spirit which pervaded the gathering. The extent of the Iron and Hardware interests of Cleveland was at the same time brought home to the merchants in a forcible and very pleasant man-

ner, some of them obtaining thus for the first time an adequate idea of the position of the city as a producing center, destined apparently to have at no distant time a foremost place in Hardware and Iron production. The extent and diversity of these interests is indicated in the following list of the manufacturers of Cleveland who united in tendering the banquet:

AMERICAN WIRE COMPANY.
AUSTIN POWDER COMPANY.
AMERICAN WASHBOARD COMPANY.
BAACKES WIRE NAIL COMPANY.
BOURNE & KNOWLES MFG. COMPANY.
CAMBRIDGE IRON COMPANY.
CHAMBERLIN CARTRIDGE & TARGET COMPANY.
CHAPIN BOLT & NUT COMPANY.
CLEVELAND FOUNDRY COMPANY.
CLEVELAND HARDWARE COMPANY.
CLEVELAND BLOCK COMPANY.



Badge Used at the Cleveland Banquet.

CLEVELAND CITY FORGE & IRON COMPANY.
CLEVELAND LOCK COMPANY.
CLEVELAND MACHINE SCREW COMPANY.
CLEVELAND ROLLING MILL COMPANY.
CLEVELAND STAMPING & TOOL COMPANY.
CLEVELAND STONE COMPANY.
CLEVELAND TACK WORKS.
CLEVELAND TWIST DRILL COMPANY.
DANGLER STOVE & MFG. COMPANY.
EBERHARD MFG. COMPANY.
ELLWOOD TIN PLATE COMPANY.
H. C. TACK COMPANY.
HP NAIL COMPANY.
HART MFG. COMPANY.
JOHNSON & JENNINGS COMPANY.
LAKE ERIE IRON COMPANY.
LAMSON & SESSIONS COMPANY.
MECHANICAL RUBBER COMPANY.
AMOS B. MCNAIRY COMPANY.
NATIONAL SCREW & TACK COMPANY.
PECK, STOW & WILCOX COMPANY.
PEERLESS MFG. COMPANY.
SCHNEIDER & TRENKAMP COMPANY.
STANDARD TOOL COMPANY.
UNION STEEL SCREW COMPANY.
UPSON NUT COMPANY.
VAN WAGONER & WILLIAMS HARDWARE COMPANY.
VAN DORN IRON WORKS COMPANY.
WINTON BICYCLE COMPANY.

The manner in which the tables were arranged is indicated in the accompanying diagram. All the arrangements were so admirably devised and efficiently carried out that there was not the least confusion in the seating of the guests, each one being given a badge with his number on it, and also a diagram of the tables and an index giving the numbers and names of all the guests. He was thus enabled readily to find his place at the table and, by means of the badges worn by the others and the index, to establish their identity in case he was not acquainted with them. The style of badge is shown in the accompanying illustration.

For the admirable manner in which the banquet was arranged and conducted much credit is due to the following committee of arrangements: C. S. VAN WAGONER of Van Wagoner & Williams Hardware Company, C. E. ADAMS of Cleveland Hardware Company, W. P. CHAMPNEY of Eberhard Mfg. Company, and S. A. SAGUE of American Wire Company, with whom were associated F. F. PRENTISS of Cleveland Twist Drill Company and W. D. B. ALEXANDER of National Screw & Tack Company, Committee on Speakers.

The tables were tastefully decorated with flowers and presented a fine appearance. The dinner was admirably served in accordance with the following

Menu:

Blue Points.

Consommé. *Amontillado.*
Olives. Salted Almonds. Celery.

Planked Whitefish. *Haut Sauternes.*
Cucumbers. Potatoes Duchess.

Filet of Beef, Larded. *Pontet Canet.*
Cauliflower. Fresh Mushrooms.

Sweetbreads, Braised.
French Peas.

Punch au Kirsch. *Cigarettes.*

Broiled Quail. *White Seal.*
Lettuce Salad.

Bisque Glacé. Cake.

Toasted Water Biscuit and Cheese.
Cognac.

Coffee. *Cigars.*

At the conclusion of the dinner the attention of the assemblage was especially directed to the following

Toast List:

Introductory Remarks by the Chairman,

C. S. VAN WAGONER,
President Van Wagoner & Williams Hardware Company.

Address of Welcome,

LUTHER ALLEN,
President Cleveland Chamber of Commerce.

Progress Made in the South in Past Three Years Toward Improved Business Methods.

A. D. LANGSTAFF,
President Southern Hardware
Jobbers' Association.

The Hardware Merchants' and Manufacturers' Association of Philadelphia.

WILLIAM W. SUPPLEE,
President Hardware Merchants and
Manufacturers' Association of
Philadelphia.

Cleveland,

J. H. HOYT,
Hoyt, Dustan & Kelley.

C. S. VAN WAGONER of the Van Wagoner & Williams Hardware Company presided as toastmaster, and in the most effective and felicitous manner. His introductory address, as well as the remarks made in introducing the different speakers, was exceedingly happy. His opening remarks were as follows :

Toastmaster's Address.

Gentlemen of the Visiting Jobbers: It is with great pleasure that the manufacturers of Hardware of Cleveland entertain you this evening. We are very much pleased, indeed, at having this opportunity to meet you face to face. We are more than pleased at the opportunity of meeting those whose names, though we have never met them before, are so familiar that they are almost like household words. I have in my own heart a very warm feeling for many firms represented here to-night, and when I grasp their representatives by the hand I feel a thrill of pleasure that at last I have met some one who has an individuality connected with a house with which I have had pleasant relations, and I am sure that is the sentiment of all of us.

As manufacturers, we occupy a peculiar position this evening. We don't know exactly why you are here. We suppose it is for some great, good purpose, but we are not sure of it. [Laughter.] We have been so often crushed to the earth and had to rise up again, that we are not sure but what this is some well-fledged plot for skinning us still more. [Laughter.]

When in this Entertainment Committee it was proposed we should have an embossed anvil on the front page of the menu card, I suggested that we should have a sheep with the wool shorn off as representing the manufacturers, and that on the last page we should have what is usually appended to one of our bills—a discount mark of 80, 20, three 10's, 5 and 2½ per cent. That, gentlemen, was to represent you jobbers. [Laughter.]

We have had a feeling that you were hatching up something that meant purgatory, like the syndicate buyer, for whom we have not always the greatest love, although we expect to meet him and get his little orders. We do not know exactly what you are hatching up, but we are very sure we will know the consequences before long. We feel that there is only one thing that is going to save us from the syndicate buyer, and that is that we reside and live and move in Cleveland. [Applause.] There are advantages here. I do not dare to tell them, because the first thing we know you will want something extra. [Laughter.] These advantages give us the hope that if we persevere in business we will still survive, no matter what you ask of us. Cleveland, we know, has a great future as a manufacturing center. [Applause.] We

feel that, instead of our always sending our representatives to you, we are going to have you come to us. I believe it would be for your interest as jobbers to come occasionally to see us, visit our plants and make yourselves better acquainted with us. Although we have to say it ourselves, we are a very generous body of men. We are willing to give you the most of our profits and an extra special discount at the end of every six months, provided you keep it to yourselves. [Laughter.]

Now, gentlemen, I am not here to occupy your time. There are others here who will welcome you, interest you and tell you of the advantages of Cleveland. But I wish to say, in closing, that as manufacturers we would consider it a very great compliment if you would spend a little time with us. It seems a pity that such a body of men as this should come so far—and we are afraid we shall not see you for many a day—and go away without becoming familiar with our plants. We feel that we have something to show you that will interest you if you will give us the opportunity. [Applause.]

I wish now, gentlemen, to refer to a feature in Cleveland that has interested all of its citizens very greatly, and that is that within the last two years there has been a most delightful indication of public spirit in the development of the city through the organization of a Chamber of Commerce. I must say, as a new comer from the East, for I am only lately a Clevelander, that it has delighted me to see the enthusiasm and almost boyish spirit that has been manifested by the Chamber of Commerce in promoting the great interests of Cleveland. I refer to this because we are about to be addressed by one who is an exponent of the energy and enthusiasm to which I have referred.

I have the pleasure of introducing to you Mr. Luther Allen, president of the Chamber of Commerce.

Address of Welcome.

MR. ALLEN was very heartily greeted by the company, and when the applause had subsided spoke as follows :

I esteem it not only a pleasure but a privilege to be invited, on behalf of the hosts of the evening, to welcome you as guests, as "the stranger within our gates," and to extend to you as well a cordial, hearty welcome from every Cleveland business man. [Applause.]

I also desire to extend this word of welcome on behalf of our Chamber of Commerce—the outgrowth of our old Board of Trade. It was organized less than two years ago upon a line looking to the advancement of our city. I welcome you to the hospitality of our homes, and in every way possible, as would become a citizen of Cleveland.

The rooms you have made use of as your meeting place are our temporary quarters only, and when this organization, strong and earnest in the direction for which it has been formed, comes back to us in 1896, our centennial year, we hope to have a magnificent home in which to receive you. That is our ambition, an ambition which we have no doubt will be realized.

I learn that during this day the wholesale jobbers of Hardware have perfected an organization. We Clevelanders are glad that this organization has been perfected here. We think Cleveland is a good place to be born in, either for the individual or the business association. We know it is a good town to live in, and we believe it is a good town to come to. [Applause.]

Organizations such as you have called into being to-day are of great value. I sincerely believe that this particular organization will accomplish great good upon the lines which I understand have been marked out for

it. But in forming this organization you have simply laid the corner stone. Organizations, by-laws and rules are all wise and proper, but they do not do all the work. It remains for every individual member of the organization you have called into being to feel that upon his shoulders rests the responsibility of its success in order to realize the best results. As an illustration of this fact I can refer to our own organization—the Chamber of Commerce. A more united, sincere and earnest body of men, numbering more than 1000, was never gathered together in any city. Loyal in every way to the principles underlying its organization, it has already become a powerful factor in every good work of advancement of our city. Therefore you will make your organization strong only by individual effort—by hard work. In such an organization concert of action is absolutely necessary.

It is a source of gratification to me that I have been called upon to deliver this message of welcome to you, and now again, in behalf of our hosts, as a representative of the Chamber of Commerce, and as a citizen of Cleveland I bid you welcome in the best and fullest sense of that word—one of the few words that may be named in the same breath with wife, mother, love and home. [Applause.]

Mr. Langstaff's Address.

In introducing the next speaker Mr. VAN WAGONER referred to the relations between the North and the South, and the sentiments expressed evidently had the heartiest approval of all the guests, who greeted Mr. LANGSTAFF with great heartiness. Mr. VAN WAGONER'S remarks were as follows :

I am sure I voice your sentiments when I say the Committee of Arrangements had such sympathetic feeling for the business energy and progressive methods which were developing in the South, that they were pleased to call upon a representative of that section who is now with us to be one of our principal speakers. I am sure that the North feels most generously toward the South. Leaving politics aside, we men of business wish to extend a helping hand toward them, and we are glad to see an awakening in that country, as shown by their adopting the methods that have been successful in the North. I know that you will welcome Mr. Langstaff, the president of the Southern Hardware Jobbers' Association, whom I now present to you. [Great applause.]

When the applause had subsided Mr. LANGSTAFF spoke as follows, giving a careful and comprehensive view of the progress of industrial and mercantile interests in the South :

I cannot adequately express my appreciation for the distinguished honor of having been invited to address you.

Whatever hesitation I might have felt in accepting this invitation if it had been extended only to me personally, became a secondary consideration when I was assured that in addition thereto the manufacturers of Cleveland extended the invitation to me officially as the president of the Southern Hardware Jobbers' Association, and that they desired by and through this invitation to offer the hand of fellowship to that association.

In their name I very gratefully acknowledge this kindly expression, and assure you that I will advise each member of the association of this fraternal feeling. I know that in their hearts will be aroused a very genuine response. [Applause.]

When I reached Cleveland on Tuesday morning I had not concluded to

be present to-day—had no expectation, even if I remained, of being other than a "looker on" and a "gatherer in" of what I might see and hear. I had no expectation of having this "greatness thrust upon me."

When I was advised that my friend from the City of Brotherly Love, Mr. Supplee, would follow my short talk with a speech, my mind was comforted by the hope that in like manner, as at the feast held many, many years ago, at which the poorer wine was offered first so that whatever evidence the guests may have received of its lack of quality was removed by the unquestionable superiority of the flavor and aroma of the wine that followed.

I congratulate the

Cleveland Hardware Jobbers

for having inaugurated this meeting—for having invited their fellow jobbers from the North, from the South, from the East, from the West. The sincere welcome that you have offered us has formed a lodgment in our hearts and will there be treasured and remembered in days that are to come. [Applause.] The opportunities that have been here presented for a more intimate personal acquaintance, for the interchange of thought pertaining to business methods and business perplexities, will undoubtedly have beneficial results.

I congratulate the

Manufacturers of Cleveland

that they have supplemented the efforts of the Cleveland jobbers by inviting the guests to this banquet board. It is the link that will help to bind us together.

There is no factor that is more potent to arouse kindly feelings and to create more favorable impressions of what may have been or may be said here to-night, than the good dinner of which we have partaken. I know, from the very pleasant expression upon the faces of each of you, that this entertainment has been enjoyed and will be remembered by the jobbers present, and that they will during the coming year extend to the Cleveland manufacturers such generous orders that will gladden their hearts and will assist in placing the balance at the end of the fiscal year on the right side of the ledger.

The Southern Association.

Referring to the meeting held by the Southern Hardware Jobbers, at Richmond, last June, and to the previous meetings, I am glad to announce that benefits have resulted therefrom. Among the subjects discussed from which benefits have resulted has been the shortening of time on which we sell goods and the decrease of dating bills ahead. It had been the general custom by the jobbers throughout the South to carry over to November and December a considerable portion of the indebtedness for goods bought in January, February and March. These accounts would be closed by notes and the notes would be discounted in the banks. Apprehension as to their prompt payment was always incident and compelled us to retain in the bank, during the months these notes might be falling due, a special reserve to cover those that might not be paid. As already stated, this subject was discussed at considerable length and each member expressed an earnest wish for a change. A resolution was passed that the members would endeavor to abandon it. It was not possible to make the desired change at once and to uproot a custom that had been fastened on our business from its birth. I do know, however, that the custom has been very much decreased. The jobbers of Memphis began the work of making a change three years

ago, and agreed last spring that they would not grant longer time than 60 days. By this co-operation were reduced to a minimum, by June 1, unpaid balances for goods bought during January, February and March. This endeavor to shorten time is not confined to the Hardware jobbers of Memphis, or of other cities in the South, but has been adopted by the jobbers of other lines, and by the country merchants. Their efforts have contributed more than any other to the increase in food products throughout the South. The prime cause of these long credits on general merchandise was that nearly all the available cash was consumed in buying food products, which could only be bought for cash.

There has also been very considerable progress made by the members of the Southern Hardware jobbers toward solving the problem of salaries paid to traveling salesmen to determine the profits and expenses incident to that branch of the business so that each salesman would receive equitable compensation.

Development of the South.

I have several times to-day been asked the question, "How is business in the South?" I might repeat here to-night the answer that I have made. We have felt the hard times that have prevailed for the past three years and we feel them now. A wonderful and encouraging change has taken place. We feel that we have crossed the Valley of Depression and that we are emerging from the dark clouds that surrounded us in 1893. [Applause.] That we are climbing the hill upon whose crest is bright sunshine, cheering us onward and upward to more prosperous conditions.

Previous to three years ago the custom of making advances to the planters to assist them in buying mules and food products to produce a crop was very general and very liberal. The custom of raising nearly all cotton and buying hogs and hominy generally prevailed.

The lessons that had been taught by the press of the South, urging the farmers to diversify their crops, had not been heeded. With a soil capable of producing everything and anything—with seasons offering every inducement for the growth of whatever might be planted—we hesitated to plant anything that might even in a humble way aspire to be a rival of King Cotton. It became evident three years ago to the cotton merchants and to other merchants who had been making these advances that the balances on their ledgers had been increasing and that they must decline to advance as liberally as previous thereto. The planters were compelled for this reason to depend on themselves and planted more corn, raised more hogs and began the cultivation of sorghum cane. Two years ago the advances were again reduced, followed by increase of corn, hogs and molasses, which are the three principal food factors of the plantations. One year ago the advances were again decreased.

In three years the number of acres devoted to corn, sorghum cane, potatoes, grasses, grains, hogs, cattle, have increased to such an extent that in the States contiguous to Memphis there is ample for another year. So abundant is the corn crop that instead of being buyers we are sellers. Instead of having to buy molasses at 50 cents a gallon, there are thousands of gallons for sale at from 15 to 20 cents per gallon, many carloads of which have been shipped to Northern refineries. The vast quantities of corn will enable the planters to increase the production of hogs, of which we will probably have enough for next year's consumption.

These conditions have never existed before. While the price of cotton is lower than at any previous time, everything else is relatively low. The proceeds of a bale of cotton will buy almost as much as when higher prices prevailed. The exposition that I have made of the improved conditions of the South will, I trust, be interesting to the manufacturers present whose products are used on Southern plantations.

Future of the South:

I have been asked to-day questions relative to the future of the South. It affords me great pleasure to say that from those who have been observant of the improved conditions that I have mentioned, and who have traveled over the South investigating its lands, that the prospects are very encouraging; that a large number of people, embracing many families from the West and Northwest, have purchased lands in Tennessee, Mississippi and Arkansas, who find in those States a fruitful soil, a genial climate, and are welcomed by our people with a hospitality as warm as hearth's can give. No longer are there questions asked as to the politics of those who are seeking homes in our South land. [Applause.] All we want to know is that the new comer is desirous of assisting us in building up our country.

I thank you for the attention you have given me. [Much applause.]

Speech of William W. Supplee.

The next speaker was the president of the Hardware Merchants' and Manufacturers' Association of Philadelphia, WILLIAM W. SUPPLEE, who was very heartily received. From his able and interesting address we make the following extracts:

When I received a telegram a few days ago asking me upon what subject I would respond, I replied the Philadelphia Merchants' and Manufacturers' Association of which I was president. I did not realize then that there would be so many presidents in the field. We have here, first, the president of your Chamber of Commerce, who has given you a sample of his eloquence; next, Mr. Langstaff, president of the Southern Hardware Jobbers' Association, selected for his qualities known and fully realized only by those members of our association of jobbers who have had the opportunity of seeing as much of his work as I have. I was present at their last meeting at Richmond. It was a pleasure to see how they joined hands in one general feeling for the betterment of trade. When I look to my left I see Cleveland's favorite son. [Applause.] It is Mr. Hoyt, gentlemen, who is to furnish the wine on this occasion. [Applause.] Looking beyond him I see the president of the New York Hardware Club, known for his eloquence throughout this broad land.

One reason for my telegraphing as I did, gentlemen, was the fact that the Philadelphia Hardware Merchants' and Manufacturers' Association is looked upon as one of the solidest organizations of the kind in the United States. Other associations have sprung up, but for want of proper support and nourishment they have gradually drooped and died. The nucleus of our association was eight jobbers and three manufacturers. At that time but very few Hardware jobbers ever came in contact with each other. Very few of them were personally acquainted. If they passed in the street they would scarcely have recognized each other. The result of our association has been not only cordiality of feeling but solid intimacy. [Applause.]

The object of our association, as stated by our by-laws, is to promote a

more cordial feeling among the jobbers and manufacturers of the city of Philadelphia. Thus far it has been a great success socially. Our business meetings once a month have been models. We have a semi-annual entertainment during the year, with discussions, speeches, recitations and songs, and one annual banquet. We look upon these social gatherings second to but very few of any kind in our city. There has never been any dissension in our ranks. On the contrary, many matters have been brought forward and settled that otherwise, outside of our organization, in all probability, would have resulted in very bitter warfare. We look upon its object as very worthy. It was formed because in union there is strength. [Great applause.]

Address of James H. Hoyt.

A very effective and interesting address was made by JAMES H. HOYT, who is an after-dinner speaker of rare ability and acceptance. The pressure on our space does not permit us to give his speech in full, but the following extracts will be of special interest as referring to the diversified manufacturing interests of Cleveland and the distribution of Cleveland products throughout the world:

The influence of Cleveland is not confined within her own borders wide and extended as they are. She has made herself felt the world over. I have read the *Times* in London by the light of Cleveland oil. The enemies of England in the far corners of the globe have been shot down by bullets fired from a gun developed and owned by Cleveland capitalists. The dense fog of London is even now pierced by the radiant beams of an electric light invented by a distinguished citizen of Cleveland and first manufactured here, and the same illumines the brilliant boulevards of Paris and Vienna and glistens on the icy surface of the Neva. The rivet holes in the plating of the monster warships of the navies of the world have been pierced by twist drills manufactured here, and the perspiring and patient Nubian, cultivating the lands made fertile by the overflow of the waters of the majestic Nile, wears his jaws and makes his breath fragrant by the constant chewing of Cleveland gum. The secrets of the brilliant constellations of far distant skies are discovered by the aid of Cleveland telescopes, and a modest astronomer, resident here, has made the name of Cleveland known wherever learned men

Look through Nature up to Nature's God.

Wherever the glaring beams of the electric light penetrate, carbons manufactured in Cleveland are used. Garments in remote places of the earth are made on Cleveland sewing machines. Tramways are run by Cleveland cable machinery and Cleveland electric motors. Houses in distant localities are builded with Cleveland tools, made secure by Cleveland wire nails and bolts; fitted with Cleveland hardware, and are made beautiful by Cleveland paint. Their hospitable doors swing upon Cleveland hinges, and are closed against intruders by Cleveland springs; and the food served in them is made palatable by Cleveland salt, which never loses its savor; and cooking is made possible in the torrid regions of the equator by the use of Cleveland oil and vapor stoves. Vessels are unloaded in distant harbors by Cleveland hoisting machinery. The nervous systems of far away barbarians are paralyzed with electric shocks caused by the fierce energy created by Cleveland dynamos. Cleve-

land ships not only carry the commerce of the Great Lakes, but plow the restless waters of the mighty ocean. Cleveland bridges span distant rivers; messages are flashed hundreds of miles over Cleveland wires, and trains, away West and South of us, rush onward over Cleveland rails.

The dawn of Cleveland's future is breaking; her horizon is brightened by the brilliant beams, not of a setting, but of a rising sun. For more than half a century she has been plunged in a profound and dreamless slumber. She has grown great in spite of herself. It is only just lately that she has awakened and begun to stretch herself, only just now that we, her citizens, are beginning to appreciate her beauty, her size, her strength and her capabilities.

We heartily welcome you to our growing city. We welcome you all the more warmly because your visit here is not for idle curiosity, and the prime object of your meeting is not for mere pleasure but to improve methods of business and to promote the prosperity, not only of the city but of the whole country. That was a wise notion of the Brobdignagian, whom Gulliver met in his travels, "for he held to the opinion that whoever made two ears of corn or two blades of grass grow on the same spot of ground where only one grew before deserved more of mankind, and rendered more essential service to his country, than the whole race of politicians put together."

What is true of the agriculturist is true also of the merchant or manufacturer. If he raises the standard of his goods, if he improves their quality, if he extends their sales, he renders the most essential service to mankind and his country. [Loud applause.]

Addresses were also made by R. R. WILLIAMS, Hardware Editor of the *Iron Age*, and WILLIAM H. WILLIAMS of the Hardware Club of New York, the former congratulating the trade on their coming together in a fraternal way and for the promotion of their mutual interests. The president of the Hardware Club spoke in his usual happy vein, referring especially to the circumstances under which the club of which he is president was formed, and to its position and plans.

Mr. Williams spoke as follows:

After the eloquent address of Mr. Hoyt, which so graphically portrayed the glories of Cleveland, I can even more keenly than three days ago appreciate the honor of being invited to a banquet in this city. You were most kind to invite me, and you have emphasized that kindness by the cordiality of your greeting. For the invitation and the welcome I am deeply grateful in so far as they are personal to me, and in behalf of the organization which I have the honor to represent, I thank you for the kindness and warmly reciprocate the greeting.

Meeting, as we do, in this beautiful and progressive city under the auspices of an association comprising some of the largest and most enterprising merchants in our business, with representative guests from almost every important distributing center of the country, and meeting, as I believe, in a spirit of reciprocal helpfulness for the consideration of matters of common interest to you all, the augury for the future of the interests with which you are severally identified is cause for hearty congratulation.

There was just a little air of mystery a day or two ago about the objects of the gathering—who were coming, &c.—but that was soon dispelled, and it has been beautiful to witness the harmony which in solid chunks has been

in evidence about this hotel during the past two or three days. [Applause.]

A colored porter opened the door of a sleeping car next to the one I was in this morning and with true African politeness, mingled with a native tendency to "mix metaphors," informed the ladies that the whole car was at their disposal as "dere was no gemmen on the car."

I have observed that, with a corresponding sense of security arising from the absence of retail merchants from this festive board, manufacturers and jobbers have been, privately if not publicly, exchanging confidences and making promises with a candor that is equally refreshing and edifying.

In this spirit I may say that, as a manufacturer, I have always entertained the highest respect for jobbers, especially those who have the good sense and excellent judgment to purchase my goods to the entire exclusion of those of other manufacturers.

I very well remember, as many of you do, the cry that was raised a good many years ago that "the jobber must go."

That reminds me of an incident that occurred at the close of the "late unpleasantness between the North and the South." You will remember it had been predicted that before the Confederacy would be conquered, grass would grow in the streets of New York. When the news that Richmond had fallen reached New York, a monster mass meeting—one of those spontaneous gatherings of the people that occur in times of great excitement—was held in front of the Custom House in Wall street, and the venerable Abram Wakeman, who was called upon to speak, raised his hands impressively and warned the people "to get off the grass."

You will agree with me that as a wholesale merchant, at least, the jobber is here to stay, while those who predicted his extinction have long since taken their departure.

About the only fault I have to find with him is that he lets so little grass grow under his feet when hay is scarce with the manufacturers.

We like to talk about the "white wings of commerce," but they are not "in it" with those wingless angels, who, representing the great mercantile houses of this country, carry the peaceful banners of trade into every hamlet where there are wants to be supplied. We hear about "ships that pass in the night," but the commercial tourist passes not. He usually stays in if there is only the ante to be played for. His determined and progressive energy have been a co-working force with art and science and religion in advancing the cause of civilization in the nineteenth century, for wherever he goes he carries information and diffuses sunshine, and when he leaves there is a yearning, if not an aching, void. And so I say that you who are responsible for his employment (and who reap the lion's share of the fruits of his labor) are here to stay, for the system of which you are a part is an integral factor in the civilization of the age.

There is much about which I would like to instruct you concerning your duties as merchants, and the limitations you should set upon yourselves in your exactions as buyers, but I must omit that pleasing task on this occasion. I have wandered from the subject upon which I was asked to speak, "The Hardware Club of New York."

Mr. Williams then gave a brief but interesting account of the origin and progress of the club of which he is the president; referred to the practical benefits its members have derived from it and in closing expressed the hope

that a large spirit of kindly charity and helpfulness worthy of the splendid trade to which we belong might displace narrow mistrust and selfishness as the outgrowth of trade organizations such as that whose happy beginning the banquet celebrated.

At the suggestion of JOHN ALLING of Chicago, three cheers were given for the manufacturers of Cleveland, and after uniting in singing "Auld Lang Syne" the company separated, with mutual congratulations on the success of the banquet, and the cordiality and harmony which characterized all the proceedings of the day.

Convention Notes.

A very elegant dinner was given by S. H. Chisholm, president of the HP Nail Company, at the Union Club on Friday evening to a number of the visiting jobbers. It was an exceedingly enjoyable occasion.

A number of manufacturers and their representatives resident beyond the limits of Cleveland were in the city at the same time as the jobbers. Among these was Harry C. Disston of Henry Disston & Sons, Philadelphia, who has lately returned from a foreign trip devoted to advancing the export interests of his house. James P. Kelly, general manager of the Kelly Axe Mfg. Company, Louisville, Ky., was also present, as well as representatives of G. & H. Barnett, Philadelphia, and some other manufacturers.

The attendance of outside manufacturers, however, was not large, no general invitation having been extended to them. In this respect the gathering was very different from that of the Southern Hardware Jobbers' Association at Richmond last summer, when the presence of a large number of representative manufacturers added not a little to the pleasure, character and success of the meeting. As the Cleveland convention was, however, simply a preliminary one for the purpose of considering the question of the formation of a national association, it was obviously not feasible to extend a general invitation to manufacturers, but perhaps this may be deemed advisable when the association meets next November in Pittsburgh. Such a course and the conferences which would naturally result would tend to bring the producers and distributors of Hardware into close and friendly relations and to cultivate harmony in business methods of these two great classes.

A great deal of credit is due to the jobbers of Cleveland for their good offices in calling together the jobbers of the country to confer in regard to the formation of an association. The courtesy with which the guests were received and entertained was much appreciated and left a very pleasant impression on the minds of all.

Among the invitations received by the convention to visit the manufacturing establishments of the city was one from the Cleveland Rolling Mill Company, who made special arrangements for the transportation and entertainment of the visitors, a goodly number of whom had the pleasure of making an inspection of their works, which were in full operation. The new and very complete factory of the

Van Wagoner & Williams Hardware Company was also visited by many, and called out expressions of interest and approval. Many of the other factories also came in for a good share of attention, but regret was freely expressed that time was so limited as to prevent even a cursory view of the many interesting plants connected with the manufacture of iron and steel.

The Annual Stock-Taking.

We have received several communications bearing on this subject which touch upon some practical questions to which reference is made below. We also give another carefully prepared article on inventory methods.

WE ARE INDEBTED to the Haynes & Chalmers Company, Bangor, Maine, for the following description of their method of stock-taking, which they advise us they have successfully used for several years. It differs, it will be observed, in some respects from any which we have described, and their account of it contains practical suggestions of value:

Our store is divided into sections; we have three in the main store, and two storehouses. We get the stock in good condition in the first place, collecting odds and ends, and placing them properly on the shelves. After this is done we put on four (and sometimes more) crews of two each, taking our whole stock in this manner in the course of a week's time. One of each crew counts the packages, and the other writes them down on the sheet. Instead of a book for each we use foolscap paper about 8 x 12 inches. These sheets are numbered in sections, the first section being numbered A, the second B, &c. We give to the No. 1 crew one of these sheets, on which he writes at the top "Section A, north fourth story," and as he progresses down toward the main floor he marks each sheet in the order in which it comes. When he has filled this sheet he brings it to the office, being instructed to leave spaces for figuring discounts, &c. This sheet (as are all others) is priced from a book in the office, which we keep up to date, and, with the others, makes part of a book, which is simply taken to a bookbindery and sewed, each section being placed in rotation—A, B, C, &c. Then the book is paged, after which a summary of each leaf is brought forward to the final sheets in the book in this manner:

Page No. 1, north fourth story, \$1000.
Page No. 2, north third story, \$1600.
And so on. Thus we can readily turn to each page and know just the amount of stock in each loft or room as often as we wish. It would also facilitate insurance in case of fire.

An account is kept of goods sold that have previously been taken, which account is deducted from the summary, after which the freight is added, we figuring the stock without any regard to freight in the first place. We keep account of the goods purchased during the year; then we keep an account of the freight paid out. For instance, we have purchased \$150,000 worth of goods; the freight on them is \$5000, and now our stock on hand is \$50,000. We would reckon the freight on the same just one-third of the \$5000, or \$1666.67.

We price our goods as nearly as possible at what they are worth the first day of January and make a good discount for unsalable or shop worn

goods. In this way we think we get a fair and square account of stock. No use in cheating ourselves.

We have nothing to say in regard to book accounts in this connection.

Cost of Goods.

The question as to whether or not freight charges, expense of boxing and cartage, &c., should enter into the cost of goods in the annual inventory is deserving of attention. In this matter there is no uniformity of usage among the trade. For example, one house advises us that they add to the cost of the goods no expense of express, freight, boxing or cartage, with the single exception of iron, to the cost of which they add freight charges only. Another house in Northern Illinois writes us that being so near Chicago they do not add freight and cartage when making out inventory, letting the cash discount offset freight. They, however, suggest that when doing business at any considerable distance from the market a good usage is to add freight and deduct an average cash discount of 2 per cent. from the total value of the stock. In making out the inventory it is obviously wise to aim to invoice everything at the actual cash value, and they prefer to have it a little low rather than too high.

Store Fixtures.

The basis on which store fixtures should be treated in the stock-taking is one which has not heretofore been touched upon in the discussion of the subject which has appeared in our columns, but it will be observed that a reference is made to it in the article printed herewith. On this point a well equipped and carefully managed house advise us that formerly they deducted a percentage each year from the value of store fixtures as given in their last inventory. This method, however, they have abandoned, as they realized that in case of fire they would probably get from the insurance companies only what their inventory called for, while their fixtures were worth to them, and would cost to replace, their original price. Their practice now is to put them in at cost price when in good condition.

Another house charge up to Profit and Loss 5 per cent. on cost of store fixtures, tinner's tools, horse, wagon,

sled, awning, &c., as they estimate that this represents fairly the average annual depreciation.

Taking Stock

BY C. T. ROSENTHAL.

STOCK should be taken at least once each year; in some cases it may be advantageous to take it oftener.

The purpose of taking stock is:

1. To arrive at the present true value of goods on hand.
2. To have goods thoroughly cleaned and properly arranged.
3. To take note of stock in general so as to be able to determine which goods or line of goods should be discontinued, to bring forward slow sellers, &c.

Time for Stock-Taking.

Stock should preferably be taken at a season when there is the smallest amount of goods on hand, or when the employees have the least other work to do; and should coincide with the general or annual closing of books of the firm. The majority of houses do this on or about December 31; if the above mentioned conditions prevail at this time it is well enough, but when this is not the case, the time should be changed, as there is no good reason why the business year should be the same as the calendar year.

Preparation for Stock-Taking.

Get goods in order; have damaged articles repaired, order such parts of stoves, machines, &c., as are necessary to complete them, cut the broken glass into regular stock sizes, that there may be no delay when work on stock commences.

Taking Stock.

Commence early enough so as to finish on the day selected. Begin with slow selling goods first; this saves work in keeping account of goods sold during stock-taking. Start at a certain place and take the stock right through, proper care being taken to omit nothing. If there is enough help available two or more parties, of two or three persons each, may be at work at the same time. Goods should be taken out of the shelves or bins, goods and shelves, &c., well dusted, broken packages opened and contents counted, weighed or measured, as the case may be, and then some one familiar with the goods should call them off to another person to write down.

Arrangements.

Any kind of ruled paper, say tablets 7 x 10 inches in size, will do for this. Take a flat box, fasten the tablet on top of it to form a movable desk; also a covered pasteboard box in which to put the sheets of paper when written on. Where there is a "line" of goods take down the smallest size or number first, and follow this up until the largest size or number is reached. Leave two or three blank lines between the different kinds of goods, except where there is a "line" of goods, *i. e.*, goods of the same kind, only different sizes

or numbers. Write on one side of the paper only—when a sheet is filled, tear it off and place it in the pasteboard box and keep on till all the stock is taken.

Filling Slips.

Take the stock sheets and tear them off at the dotted lines, as shown herewith:

	Inches.
3 <i>Standard Bellows</i>	32
2 " ".....	34
1 " ".....	36

1 <i>Eagle Anvil</i>	\$70.00
1 " ".....	80.00

1 <i>Solid Box Vise</i>	\$35.00
2 " " ".....	40.00
1 " " ".....	50.00

Pounds.

25 <i>Essex Horse Nails</i>	\$5.00
125 " " ".....	6.00
375 " " ".....	7.00
550 " " ".....	8.00

Each slip thus torn off contains only one kind of goods, or a "line" of them; assort these slips according to alphabet, using an indexed file 9 x 12 inches in size or something similar to put the slips in. When all the slips are in, take another indexed file of the same kind, take the A's out of the first file and assort them into the second file alphabetically, according to the second letter, and then copy them into the stock book, strictly according to alphabet, similar to the manner of a dictionary; then take the B's and proceed in the same style to the end. The slips containing the same goods, in whatever part of the house they may have been, will always come together at the time of copying into the stock book. Use a separate stock book for each invoicing, a book 10 x 12 inches, 200 pages, or more if necessary, is a convenient size.

Alphabetically Arranged.

If, in copying, several slips containing the same goods are found, the different quantities will be added, and copied into the stock book in the aggregate. Duplicate stock is transferred, as here shown, by changing the quantity—this page indicating stock taken in one place with quantities in the warehouse added:

Standard Rubber Belting.

75 feet.....	1½ inches, 2 ply.
64 ".....	2 " 2 "
21 ".....	2 " 3 "
63 ".....	3 " 4 "
193 ".....	4 " 3 "
87 ".....	4 " 4 "
24 ".....	5 " 3 "
213 ".....	6 " 3 "
484 and 105 feet.....	6 " 4 "
510 " 119 ".....	8 " 4 "
66 feet.....	10 " 4 "
194 ".....	12 " 4 "
55 ".....	14 " 4 "

Exc. Rubber Hose.

27 feet.....	½ inch, 3 ply.
100 and 69 feet.....	¾ " 3 "
33 feet.....	¾ " 4 "
50 and 45 feet.....	1 " 3 "
29 feet.....	1 " 4 "

Pricing.

Pricing the stock book should be done carefully by a competent person, and the aim should be to arrive at the present lowest market prices, not what the goods have cost. Proper deductions should be made for defective and unsalable goods.

Stove fixtures should be taken at a reduction, say 5 to 10 per cent., from prices of former inventory, to compensate for wear and tear.

Each page of the stock book should be added separate, so that if a correction has to be made, the page in question only has to be changed, while if the amount is forwarded from page to page, the corrections would have to be made on quite a number of pages.

Enter the amounts of all the pages at the end of the stock book and add them—this is the cost of the goods at the place of shipment. Next determine the per cent. of cost of laying goods down in the store in the following manner:

Freight, Drayage and Boxing.

Find total amount of goods bought during the year; next total amount paid for freight, drayage and boxing during the same period, and this will give the per cent. of expense of laying down the goods in the house, which rate should be added to the inventory.

During stock-taking, account must be kept of goods sold after they are written down, and the cost price or approximate thereof of the goods thus sold should be deducted from total amount of inventory, and the remainder is the value of the goods on hand.

General Remarks.

After the inventory is taken the same should be carefully gone over. Goods that have been on hand a long time should be marked down, and the sale of them pushed, so as to get rid of them. Note should also be made of such goods as have proved unsatisfactory, and means devised to make them more profitable, or to discard them altogether. Goods that have proved profitable might have consideration with a view of enlarging stock, variety and sale of same.

The writer is aware that the system of arranging the stock book in alphabetical order is not practiced generally, and will grant that there is more work involved in doing it. This additional work, however, is a small item, considering the following advantages:

No need of index for stock book.

Goods more easily found in book.

Less liability of goods being omitted or taken twice.

The goods taken may be in a good many different places in the house—in the stock book they are all together in the aggregate.

More ease in comparing stocks taken at different times.

Easier to price (if a price book is kept).

If annual sales book is kept, saves half the time of entering stock on hand.

Neater and more orderly appearance of stock book.

New England Iron and Hardware Association.

THE ASSOCIATION'S regular monthly meeting for December was held at the Exchange Club, Boston, on Tuesday evening, 18th inst., and was made a kind of Christmas festival, presided over by Chairman Haley, with the assistance of Chas. C. Adams, of Sargent & Co., who introduced the idea and presented the speakers. About 50 members and guests sat down to an excellent dinner, at the close of which packages containing toys of every kind were distributed. Each member received a reminder of his boyhood days, and the noise of drum and trumpet made the attendance of the orchestra superfluous. When the gifts had been unwrapped and duly admired, Toastmaster Adams served the intellectual banquet, introducing in turn Lieutenant-Governor Wolcott and Secretary of State Olin of Massachusetts, S. A. Bigelow of Bigelow & Dowse Company, William Chamberlain of Emery, Waterhouse & Co., Portland, Maine, and H. C. Bangs of Congdon-Carpenter Company, Providence, R. I., as the speakers of the evening. These gentlemen caught the spirit of the entertainment and contributed largely to its success, not forgetting, however, to give their remarks a solid background. Good cheer and a healthy sentiment of comradeship pervaded the meeting, and the Christmas frolic of 1894 will be pleasantly remembered.

Travers Bros. Company Hammock Suits

TRAVERS BROS. COMPANY, New York, manufacturers of Twines, Sash Cords, Hammocks and attachments, have, after four years' severe litigation, won their suits against the American Cordage Company, which is a part of the National Cordage Company. The suits involved questions pertaining to improved methods of making Hammocks, by which from four to five times the amount of product was turned out in a given time. Judge Alfred C. Cox, of the United States Circuit Court, on December 6 last, handed down his decision in two suits of the Travers Bros. Company against the American Cordage Company for infringement of two patented processes used in the manufacture of Hammocks. The decision says, referring to the Travers patents: "There is evidence that this method is simpler and more rapid than the old one; that by it an inexperienced operator can make four or five times as many Hammocks as an experienced operator can make by the old method. It saves time and money. Nothing like it was ever done before." This competition was started originally for the avowed purpose of crushing the Travers Company because it would not accept the terms of the National Cordage Company to sell out. On December 5 the Travers Bros. Company purchased by private contract the Hammock and Cotton Twine plant of the American Cordage Company, at 615 Fifty-second street, New York, together with all the raw material, manufactured stock on hand and in the hands of agents. We are advised the Travers Company will continue the manufacture of their Peerless Prize Manila Rope, and in-

tend to supply the trade direct with all the goods they make. They are likewise erecting a new plant to make all kinds of Tarred Cordage, Lath Yarn, Marline, &c.

Bicycle Notes.

THE UNITED STATES PROJECTILE COMPANY, Brooklyn, N. Y., who have manufactured for the Government a large quantity of drawn steel projectiles, have added to their business a fine plant for the production of Bicycle Tubing. They have been about two years experimenting and perfecting their process, which is the same process as they use in the production of their projectiles. Further information in regard to the method of manufacture is given in an article on the subject in another part of this issue. In addition to Tubing the company manufacture Fork Sides, Handle Bars, and Tapered Tubes. The manufacturers advise us that some of the largest and most discriminating makers of Wheels, after extensive tests, have adopted the tubing for use in their 1895 machines.

McKEE & HARRINGTON, Lyndhurst, N. J., and 173-175 Grand street, New York, will offer for the coming season the following Lyndhurst machines: Special racer, full nickel, weighing 17½ to 18½ pounds, listing \$135; semi-racer, weighing 21 to 22 pounds, listing \$125; light roadster, weighing 24 to 25 pounds, listing \$100; roadster, weighing 28 pounds, listing \$100; Lady Lyndhurst, rattan guard, weighing 26 to 28 pounds, listing \$100; Lady Lyndhurst Special, without guard, weighing 21 to 22 pounds, listing \$100; and Lady Lyndhurst Special, with guard, weighing 22 to 23 pounds, listing \$115. Special features of the machines are wood rims; high, medium and low frames; narrow tread; locking device for handle post; light weights; white ash mud and dress guard; adjusting device for alignment of both sprockets; steel bushed rivet chain, and reinforced tubing.

THE MONARCH CYCLE COMPANY, Lake and Halsted streets, Chicago, and 97-99 Reade street, New York, will market a line of Monarch wheels for '95 which they state will surpass their former product, consisting of five styles, as follows: Model No. 8, ladies', weight 26 pounds, list \$85; Model No. 9, gents', weight 24 pounds, list \$85; Model No. 10, gents', weight 22 pounds, list \$100; Model No. 11, ladies', weight 25 pounds, list \$100; and Model No. 12, racer, weight 18 pounds, list \$125. The wheels will be fitted with wood rims, tires optional; all machines will have the company's ball holder and dust protector; all sprockets are to be detachable, and Brandenburg pedals are to be used.

MYSTIC CYCLE WORKS, Mukwonago, Wis., will put on the market for the coming season a line of Mystic wheels, of strictly high grade, including the following: Ladies' Mystic, weight 27

pounds, list \$100; Gentlemen's Mystic, weight 25 pounds, list \$100; road racer, weight 21 pounds, list \$125, and track racer, weight 18 pounds, special.

PLYMOUTH CYCLE MFG. COMPANY, Plymouth, Ind., whose corporate name was changed from Marble Cycle Mfg. Company to Plymouth Cycle Mfg. Company, for business reasons, advise us that they have increased their capital stock to \$100,000, paid in, which their growing trade made necessary. The company advise us that they will not hereafter sell to jobbing houses, but will deal directly with agents, being more closely identified with them, thus restricting and protecting territory. Their output will comprise seven new models of Smalley wheels in different heights of frames, all of the highest grade, in weights from 17 to 28 pounds, tires optional, with 5-inch tread on road wheel and 4-inch tread on racers. The machines will be furnished in both aluminum and black enamel finishes. All wheels will be provided with thoroughly dust proof bearings, with felt washers added and other new features.

THE WILLIAMSPORT BICYCLE MFG. COMPANY, Pennsylvania, have removed their manufacturing plant to Weatherly, Pa., and are now known as the Weatherly Bicycle Mfg. Company, and are incorporated as a stock company with a capital of \$30,000. Their main building is of two stories, 50 x 125 feet in size, besides which are three other separate buildings which will be used for enameling, brazing, blacksmithing, &c. The capacity of the factory will be about 500 wheels per month, and it is the intention of the company to manufacture only strictly high grade machines. The works are expected to be in full operation between January 1 and 15, 1895.

BIDWELL-TINKHAM CYCLE COMPANY, 306-310 West Fifty-ninth street, New York, state that their wheel listing at \$70 weighs 27 pounds, and that their \$55 wheel weighs 28 pounds. The trade have received a wrong impression regarding the weights of these two wheels, through an error on the part of the manufacturers in stating the weights for publication, in our issue of December 6.

THE SLAYMAKER-BARRY COMPANY, Diamond Lock Works, Lancaster, Pa., John H. Graham & Co., 113 Chambers street, New York, agents, are offering for the season of 1895, two Bicycle Locks and three Bicycle Bag Locks, which are referred to as entirely new goods. The Bicycle Locks are known as the Beauty, and the Pure Aluminum. The former is a pure aluminum Lock, spring self-locking, with phosphor bronze springs, and a 15-inch tempered strong steel chain. The latter is of pure aluminum throughout, with the exception of springs, which are of phosphor bronze and steel, and the key hole cylinder, which is aluminum bronze. The Lock is finished with raised parts highly polished, and with depressed parts luster

polish. The manufacturers state that the Lock weighs $\frac{3}{8}$ ounce, while the weight of the same Lock, which is also furnished in bronze metal, is $1\frac{1}{4}$ ounces. The Bicycle bag Locks are of pure aluminum and bronze metal, light, and hand engraved. These goods, with other patterns, are shown in an 1895 catalogue devoted to Bicycle Locks.

DEMOREST MFG. COMPANY, Williamsport, Pa., are making goods in addition to their Bicycles, about which they give the following information:

We are making a novelty in the way of a Bicycle Support, which we will give with our wheel and sell to the trade. It is an attachment easily placed and will keep the wheel in position when placed against a wall, tree or post, resting on the tips of the handles, which is far ahead of the ordinary way of scratching the bars when placed against a building. It also acts as a brake and absolutely prevents any liability for the wheel to fall down or get out of position. We have a large number of Bicycle Wrenches which we are prepared to sell to the trade. The Wrench is made from drop steel forging throughout—not one part of it is anything but a drop forging. It will bear our guarantee against breakage or wear of any kind. The Wrench contains a screw driver which will be found very convenient.

Selling to Consumers.

THE New England Hardware Dealers' Association held their regular meeting on Wednesday evening, December 12, at Springfield, Mass. The business transacted was mostly in the way of informal discussion of questions connected with the working of the association. Among these the extent to which the retailers' trade is interfered with by sales made by manufacturers and jobbers direct to the consumer was carefully considered, the discussion having been opened by the following paper by John H. Clark, Nashua, N. H., which we take pleasure in laying before our readers as bearing upon a question of great and growing importance to the retail trade. It will be perused with interest:

When our secretary sent out the blanks asking that they be filled with some subject I very innocently wrote on the one sent me: "The necessity of stopping sales by jobbers and manufacturers direct to the consumer. That consumer should be able to obtain Hardware only through the retailers, as was the custom formerly." I little thought I should be called upon to speak on the subject presented.

Changed Business Methods.

From the early spring of 1867 I have been in a Hardware store. As I look back, as a Hardwareman I frequently contrast in my mind the many changes that have taken place in the manner of doing business by the retailers, the jobbers and the manufacturers; and to the jobbers and manufacturers I believe the retailers owe very much, if not the principal part, of the demoralization which exists in the retail Hardware trade of to-day.

Buying Direct.

Many of the manufacturers and jobbers have been selling to the consumer upon the slightest pretext, and once the business is commenced it is continued, the consumer getting his Hardware supplies at the wholesale prices, and in many cases the consumer boasts to the retailer that he can buy direct and as low as the dealer; this is particularly so in house trimmings to-day. Many times the retailer is called upon to furnish goods to "patch out" with or some goods the consumer has been unable to find elsewhere. If it is to patch out a job, the consumer claims the goods at the wholesale prices he has been paying, and in support of his claim he will show his bill—a regular printed bill head—with the prices paid. Sometimes the consumer is a person to whom it is not safe to give credit. That being the case, the consumer is obliged to pay cash. When it is a case of a customer of this kind, I think it would be difficult to find that the consumer failed to buy at wholesale prices and all the goods he could pay for, and a polite invitation to call again.

All Wrong.

This in my opinion is wrong in principle and practice, and, as I remarked before, I believe is accountable for nearly all of the demoralization which is found everywhere in the retail trade. Not only is it all wrong, but I believe it is bad for the wholesale trade, as the jobber adds to his expenses in doing business that way. As we all know, the expense of showing goods and selling them in small quantities is greater than when sold in larger quantities to the retailer; there are many more small accounts to look after, and in various ways it increases the expenses of doing business, and, of course, there are no more goods consumed than if the goods were bought in their proper places. The manufacturers and jobbers should leave the retailing of their goods to the retail dealers, where it properly belongs.

Referred to the Dealer.

I believe I am correct in saying that this is the only country where such a state of affairs exists; that among the older countries if the consumer attempts to buy direct from the manufacturer he is referred to the dealer nearest to him handling the goods, and the consumers can buy in no other way. In my first experience in the Hardware trade it was the custom then to sell goods in that manner in this country. When a consumer, whether an individual or a mill or factory, wanted a quantity of any goods we were always willing to sell at as small a margin as possible. Now, not infrequently, if the retailer is asked to give a price at all, he has the experience of learning he was not low enough, and perhaps the successful competitor is the manufacturer or jobber from whom he buys that line of goods, a sale that the manufacturer or jobber, as the case may be, would have had any way, and the two branches of trade should have worked together instead of against each other; and I think I do not err when I state that sometimes the price made to the consumers has been lower than the one given the retailer.

Forming Associations.

I am glad to see the Hardware trade in many parts of the country are moving in the right direction, and are forming associations with a view of bringing about an improvement in this line. "That consumers should only be able to obtain Hardware through the retailers," I believe to be of the greatest importance to-day, and, if accomplished, many of the evils of the trade will right themselves, and each

branch of the Hardware trade get its legitimate business. The plumbers of the country, I understand, have succeeded in protecting their trade, and I believe the Hardware trade, through their associations, can in time accomplish the same result. I hope all the members present will give expression to their views on the subject, and at the proper time this association will take no uncertain step for the protection of its legitimate trade.

Window Displays of Sporting and Athletic Goods.

THE FOLLOWING descriptions of window displays which have been arranged with special reference to the holiday season convey ideas in this direction which may be utilized to advantage by Hardwaremen generally, as the object is to attract attention:

H. & D. FOLSOM ARMS COMPANY, 314 Broadway, New York, have in their show window two especially fine specimens of the chase, which have been appropriately mounted by a taxidermist. One is the head of a caribou, with a pair of handsome antlers that tower 38 inches above the head. A spur from the antler on the right side turns downward, projecting forward in such a way as to form a kind of plow, which is utilized by the animal in winter to throw aside snow in search of grass, shrubs and other articles of food. The specimen is valued at \$125. The other is a Nova Scotian moose head with a magnificent pair of palmate antlers, having a spread from tip to tip of 54 inches. This specimen is valued at \$250. Another article of interest is a double barreled 12-gauge muzzle loading Shot Gun, evidently made early in the century, by Spangenberg, Sauer & Sturm & Suhl, Germany. The barrels are made of the original silver wire Damascus steel in a very superior manner. The piece is supplied with the old style hammers for exploding caps, and a safety lock horn trigger guard is provided to prevent an accidental discharge. Portions of the metal work are handsomely carved and inlaid with gold, while the hand carving on the stock is exceptionally fine. The piece, which has been loaned from a private collection, has been much admired.

SCHOVERLING, DALY & GALES, 302 Broadway, New York, have on exhibition in one of their windows a fine sample of an Eskimo robe made of Greenland eider ducks, said to be one of the few things saved from Dr. Fred A. Cook's arctic exploring expedition. It is stated that it is the work of an entire family and their friends, occupying a whole season in its production. The main portion is of a grayish color, with a border of white, in which is inlaid parts of the same material in several colors. The piece is valued at \$200. The rest of the window is filled with bird specimens, fine guns and cases, camping hamper, cutlery, fishing tackle, &c.

THE REMINGTON ARMS COMPANY, 313-315 Broadway, New York, have mounted 28 of the medals awarded them since 1865 within a large gold frame, set in a shadow box. The trophies are set flush with the surface of the wood background, which is covered with silk plush. Besides those received at the Centennial Exhibition in 1876 and at exhibitions in various parts of the United States, there are a number awarded them abroad—at Paris, 1867-1873; Vienna, 1873; Cuba, 1881, and Chili, 1875. In the same window are a number of antique guns of the sixteenth and seventeenth cent-

uries and a bicycle with a pink enameled frame.

UNITED STATES NET & TWINE COMPANY, 316 Broadway, New York, have arranged one of their windows with a fine display of Kosmic Fishing Rods, suitable for holiday gifts. They are daintily arranged in beds of light blue and canary colored jewelers' cotton, each in its own case. They are of split bamboo, mounted in combinations of ivory, silver and gold, priced variously at \$25, \$45, \$50, \$200, \$250 and \$500. The latter is handsomely mounted in gold, with ivory and cork handle. There are five sections and two extra tips. This rod is shown in a beautiful case of purple silk and velvet. The other window is filled with sporting sundries suitable for Christmas presents. Inside the door, against the south wall, are six beautiful specimen heads of Caribou deer, moose, mountain sheep, elk, Virginia deer and black tail deer. Underneath this display is a true brook trout (*Salvelinus fontinalis*), mounted in the usual way. It was caught by a gentleman connected with the house on a 6¼-ounce Kosmic rod, with fly, at the upper dam, Rangeley Lakes, Maine. It weighed when caught 9 pounds 2 ounces.

Aluminum Cooking Utensils.

PROF. JOSEPH W. RICHARDS, in the annual report of the "Mineral Industry of the United States," for 1893, refers to the employment of aluminum in the manufacture of cooking utensils in the following terms: "America has certainly taken the lead in this utilization of aluminum, which, I believe, will become the most extensive application of the pure metal that will ever develop." Judging by the extraordinary strides it has made in popularity during the past year, aluminum, in the shape of culinary and household utensils generally, has already gone far to justify this positive opinion.

SPECIAL RECOMMENDATIONS.

Up to within a comparatively short time ago, aluminum utensils were held in the popular regard more as a kind of fad or curiosity than as articles of real utility and domestic value. In the earlier days of the aluminum craze the metal became so identified with fancy ornamental articles and jewelry, that it has been a task of no small difficulty to instill into the public mind the fact that it is a metal which affords peculiar facilities and advantages when applied to ordinary household purposes. Lightness, durability, cleanliness, remarkable heat-retaining capabilities and imperviousness to rust or corrosion through chemical action, are some of the qualities claimed for kitchen utensils made of pure aluminum, and, so far as can be gathered, their possession of these attributes is not disputed.

GROWTH OF MANUFACTURE.

Small wonder is it, therefore, to learn that the demand for aluminum utensils is growing by leaps and bounds and threatens shortly to outstrip the existing output of the metal. Some half a dozen or more substantial concerns in various parts of the United States are now actively engaged in this branch of manufacture, and they are constantly extending their lines. They include such well-known names as the Illinois Pure Aluminum Company of Lemont, Ill.; Sidney Shepard & Co. of Buffalo, N. Y.; C. Sidney Shepard & Co. and the Wohler Aluminum Company of Chicago, Silver & Co. of Brooklyn, and the Griswold Mfg. Company of Erie, Pa. The man-

ufacturing requirements of these firms absorb a large proportion of the output of the Pittsburgh Reduction Company, who at the present time furnish, from their works at New Kensington, Pa., nearly the entire volume of commercial aluminum on this market.

ALUMINUM WARE.

The aggregate output of aluminum ware is growing to be very large and increases week by week. Almost every house furnishing store of any size and all the large department stores now keep this ware in stock, and are generous customers of the manufacturers. The exhibits of aluminum articles at the Chicago World's Fair no doubt served to stimulate the public interest in the metal. Persons who there bought single pieces of aluminum kitchen ware for experimental purposes or from curiosity are now, after practical experience of their utility, in many cases substituting aluminum utensils for those of other kinds as the latter wear out; and this process is growing and spreading, as the merits of the new ware become better known. Already a very full line of kitchen and household utensils is made in the metal, including Kettles, Saucepans, Frying Pans, Tea and Coffee Pots and numberless other domestic appliances. For field and camp cooking outfits especially, this metal has proved most valuable, as reducing the weight to be carried, while hospitals and institutions generally are said to be gradually adopting the use of aluminum articles for the preparation of food, on account of its sanitary qualities. The Government have lately placed an order for a 60-gallon aluminum kettle for each of the cruisers "San Francisco" and "Montgomery."

CONSIDERATION OF EXPENSE.

The question of expense has been until recently the principal bar to the more rapid popularization of aluminum ware for household use; and, although the price of the metal has been of late very materially reduced, so that pure ingot aluminum is now quoted under 60 cents a pound, the expense is still an obstacle when compared with that of other ware. But, it is claimed, that the little larger initial outlay is more than offset by the practical indestructibility of the aluminum culinary articles, as compared with those of tin, copper or enameled iron. Alfred E. Hunt of the Pittsburgh Reduction Company states that he has had aluminum cooking utensils in use in his own home for the past five years, and articles which have been in constant service for the entire period seem to be as durable and as little worn as when first put into use. Similar testimony is given by others who have had intimate experience of such ware for several years.

PROSPECTIVE PRICE OF ALUMINUM.

While speaking of the price, it may be well to correct an erroneous impression that is abroad. It is assumed that, as aluminum has come down in value from \$2 to 60 cents a pound in three years, the price is likely to continue falling, so that within a short time it will approximate to that of copper or tin. This, we are assured, is not within the range of probability, so far as can be at present judged. The process of extracting the metal from the clay in which it is found is a costly one. Until this cost can be very materially cut down the price of the metal will not sink appreciably lower than its present level. Undoubtedly the cost will be reduced in time, but the drop is likely to come very gradually and will be in close touch with any prospective lessening in the cost of the power which produces the electricity needed for the re-

duction of the metal. It is with the object of securing this desideratum that the Pittsburgh Reduction Company are now building large works at Niagara Falls. At the present time it is calculated that the cost of producing 1 pound of aluminum corresponds approximately to the cost of 1 horsepower for ten hours. Thus, as the necessary power becomes cheaper, the price of the metal will cheapen proportionately. Until that time aluminum utensils will continue to be rather more expensive than others.

ERRONEOUS IDEAS AS TO PROPERTIES.

Many misapprehensions exist, also, in regard to the properties of aluminum utensils. Some exaggerated ideas are entertained as to their absolute exemption from tarnishing, for instance. On the occasion of a recent visit to the factory of Silver & Co., in Brooklyn, the writer noticed a large aluminum saucepan of the firm's make bearing signs of hard usage, and which was badly blackened on the inside, and on inquiry was informed that this utensil had been returned from a large department store, one of whose customers had bought it on the assurance of the vender that it would never discolor. It had discolored, and the purchaser had indignantly returned it as not being what it was claimed to be. W. H. Silver, vice-president and general manager of the company, explained that this was not an uncommon occurrence, and that it arose from the ignorance of the persons who sold and handled the goods.

"We do not claim for aluminum utensils," said Mr. Silver, "that they are not subject to discoloration. They do tarnish under certain conditions. For instance, when unfiltered water is boiled for any length of time in the vessel, the sediment of the water will cling to it. Water containing a large proportion of lime, or well water impregnated with iron, will also discolor the utensil. But this discoloration is not injurious; it does not attack the metal at all, and it can be readily removed with soap and water. A simpler and equally effective way, however, is to boil the utensil in a quart of water mixed with a dessert spoonful of common washing soda. This will clean off all discoloration at once, and leave the metal untarnished and unaffected. In these cases absolutely no chemical action takes place producing anything injurious.

"The metal does not corrode or rust, nor is it at all affected by fruit or similar acids, and of this fact the concerns who handle our goods and those of other makers of pure aluminum articles may absolutely assure their customers. But they should not give them false impressions as to their immunity from tarnishing. Aluminum cooking utensils are, however, remarkably easy to keep clean. They weigh only about one-third as much as the ordinary culinary utensils, will not burn or scorch their contents, and do not break, crack or chip, being pure metal throughout."

PURITY AND ALLOYS.

The wholesomeness of aluminum is questioned by some. On this point the Pittsburgh Reduction Company are very emphatic. They give an assurance that the pure metal furnished by them contains no impurities beyond a very minute proportion of silicon and iron. The metal that is used in the manufacture of cooking utensils runs at least 98½ per cent. pure aluminum, much of it nearly 99½ per cent., with from 0.10 per cent. to 0.25 per cent. of metallic iron, and 1 per cent., or at the most 1½ per cent., of silicon. There is no lead, arsenic, or other injurious metal present in any of the Pittsburgh metal, of which practically all the aluminum cooking utensils

now made are formed. One of the great advantages claimed for these vessels is this fact of absolute purity, as well as its homogeneity of substance, there being no plating to wear off. What little wear there is is practically pure aluminum, and such infinitesimal proportion of nickel, copper, silicon or iron as is entirely inert and of no poisonous power on the human system.

SHEET AND CAST WARE.

The form of metal from which aluminum utensils are made is either sheets, which are afterward stamped and spun, or ingots, which are cast into Frying Pans, Tea Kettles and similar articles. Pure aluminum has been found to be too soft for casting purposes, and to dent too easily to give the best results. Consequently the metal is hardened in castings with an addition of 2 per cent. to 5 per cent. of copper and nickel in accordance with the amount of stiffness and hardness required.

The metal which is rolled into sheets, on the other hand, and afterward stamped and spun, is so hardened in the process as to need only from 1 per cent to at most 3 per cent. of alloy of hardening metals. The sheets supplied to manufacturers come of three qualities, denominated soft, hard and half-hard, according to the proportion of alloy contained in them. The pliability of aluminum makes it peculiarly easy of manipulation in the drawing presses and on the spinning lathe, where it does not require the constant annealing necessary when working in brass or copper.

Inventory Taking.

BY E. B. COLE.

INVOICING will soon be the order of the day, and a dirtier, more unpleasant job the Hardwareman rarely has on his hands.

All retail dealers do not take stock annually, and many never take a thorough or proper inventory. If the only feature to be considered were that of knowing the exact amount we have invested in stock and how much profit we are making each year there would be some excuse for guessing at the stock as long as there are no silent partners to object.

Guessing At.

A stock of goods which invoices at about the same figures year after year can be guessed with a surprising degree of accuracy by a competent person thoroughly familiar with the goods in question. But the mere knowledge of the exact amount we have is only one of the considerations in taking the annual inventory.

First and probably the most important is that of

Insurance.

He is a shrewd and well posted merchant that knows just how well he is insured. You may never look at your inventory unless you have a fire. There are many ways of adjusting fire losses and figuring the value of merchandise. You can rely on one fact, however—that is, the insurance companies will pay no more than they are compelled to by the conditions, and in all cases a thorough inventory as a basis to figure on is the merchant's safeguard, as the burden of proof of the value of stock destroyed lies with him. His inven-

tory and books are the only things left to show in many cases.

The invoice should show the different sizes, qualities and makes of goods so that an outsider could verify the dealer's prices if necessary.

Unsalable Merchandise.

Another important consideration in invoicing is that of cleaning out slow and unsalable merchandise. We frequently lose sight of goods in a year's business. We find goods in taking stock we could have sold had we known they were in stock, also damaged goods, goods with broken parts and goods with missing parts. The writer once invoiced a stock of pumps and plumbers' supplies that was fully half unsalable because of the lack of parts robbed to supply customers wanting repairs. We regard as the greatest good derived from invoicing the putting of everything in salable condition.

Selling Old Goods.

If there are any goods that have remained on our shelves over two years, we put them in a junk pile in our front show window and offer them to our customers at their own prices, calling the attention of every one that comes into the store to them.

We had a lot of cut brads and finish nails on hand when the change to wire nails took place, and we could not get rid of them at any price, but by mixing in some 8d, 10d and 20d nails we sold them all as mixed nails at not much below cost. It is better to sell old shop worn unsalable goods at half cost than to carry them year after year, and this method has been so successful that our customers look forward to our annual invoice sale of bargains.

We also find it policy to put in such staple goods as we may be overstocked on at about cost to help clean up the old stayers.

A Special Want List

should be made while invoicing, also a list of things to be done, such as polishing tarnished plated ware, fitting up odd locks with keys and escutcheons, making changes in the display and arrangement of goods, mounting wheelbarrows and grindstones, &c., things you cannot do while invoicing, but can easily attend to during the dull period. When ready to make our spring orders our want list shows the sizes and varieties of tools and other merchandise required to keep our stock up to our standard completeness. There are a hundred ideas for improving stock and of wants that come to our knowledge when invoicing that should be recorded and carried out. Many large stocks of goods become in a large part unsalable, as the changes in styles and prices go on, from a want of proper consideration of the real advantages to be gained by the annual house cleaning and inventory.

One Way of Taking Stock.

We have found in our climate and business conditions that the best time

to invoice is the week between Christmas and New Year's. Our new year begins with January 1, and as we never close our store to the trade while invoicing, a dull week is desirable.

We have tried taking the invoice in two books, straightening up the goods, invoicing and cleaning out as we go, taking section by section until all are finished, beginning with the goods least likely to be called for by the trade, keeping a list of all invoiced goods sold before the 1st and of all not invoiced after the 1st. We do not know how generally this plan is adopted, but it has so many objections we will not try it again. Its only advantage is that it saves re-writing the invoice.

Objections.

One objection is that the invoice books are hard to keep in good shape; that some kinds of goods are frequently listed and priced more than once, as they are found in different parts of the store, making a longer invoice. Another difficulty is in keeping a correct list of invoiced sales, as the actual taking of stock generally lasts a week or ten days. Another is that goods are not so apt to be properly listed and specified on the books as they should be.

The Best Plan.

We believe the best plan, and the one we think is usually adopted, is to go through the stock, carefully putting all in shape and getting all goods of a kind together, counting and making lists and attaching to each box or compartment, upon which all sales and changes can be noted up to the time of actual invoice. In this way the stock can all be called off and put on one book in a comparatively short time.

Estimating.

In the detail work of invoicing there are many things that require more time than their value will justify, such as counting loose screws in case and loose bolts in rack. We have always estimated these by half or full package, as the case may be. There is such a thing as being "penny wise and pound foolish" in more ways than one, and one is to think you have to get cost out of old junk stock before you can part with it. Don't keep it.

Haul off old iron stuff that lays around and can't be sold and is only taking up valuable storage room, and part with it at any price.

Invoicing is for the purpose of separating the salable from the unsalable. We all make mistakes in buying and all get overstocked at times.

Taxes, interest and rent act on unsalable stock like unimproved real estate, eating up the original investment and all the profits.

We have never used any special blanks for inventory, but where the invoice is practically made before it is called off, we think some kind of a tag or label, easily attached or removed, large enough to show the contents of a broken box or package, with a space for goods sold before invoice is taken, would be very desirable.

Price-Lists, Circulars, &c.

THE CHICAGO STAMPING COMPANY, Congress and Green streets, Chicago: Catalogue E. The catalogue treats of Steel Milk Cans and Milk Can Stock. A variety of Railroad Milk Cans is shown, comprising five of the standard patterns, also Cheese Factory Milk Cans, Setter Cans, Peddling Cans, Dippers, Cream Cans and Milk Can Stock, such as Necks, Handles, Breasts, Letters and Figures, Links, Washers, Bottoms, Covers, &c.

BANGOR EDGE TOOL COMPANY, Bangor, Maine: Lumbermen Tools. Circulars illustrate with prices the Peavey Axe, Mill Hooks, Socket Pick Pole Irons, Peaveys, Cant Hooks, Handles, &c. Special attention is called to the company's Patent Cant Dog.

A. & O. A. HUCKE, Belleville, Ill.: Powder, Oils and Miners' Supplies, Hardware, Iron and Steel. The firm issue an illustrated pamphlet representing these goods, and state that they are prepared to sell supplies at the closest jobbing prices.

PARRY MFG. COMPANY, Indianapolis, Ind.: Parry Indianapolis Buggies. An 1895 catalogue illustrates a variety of Buggies, Surreys, Carriages, Road Wagons, Road Carts, &c.

Trade Items.

THE SIMMONS HARDWARE COMPANY, St. Louis, have decided to add a line of Sheet and Galvanized Iron to their already extensive business, and after January 1 will be in the market to fill orders. In the way of Stove Pipe Iron they will handle three grades. The highest grade will be known under the name of Vulcan and will be uniform in color and smooth finish. Sheet Zinc will also be carried in stock.

HORTON, GILMORE, MCWILLIAMS & Co., 172 to 176 Lake street, Chicago, have the exclusive jobbing agency for Cole's Air Tight Heater in the States of Indiana, Illinois, Michigan and Wisconsin. This is a low priced sheet iron Stove adapted to the consumption of wood, chips, bark, &c. Its introduction into the territory referred to has been very successful, over 200 agencies having been established in the retail trade.

CHARLES C. STELLE, successor to C. C. Post, 81 Fifth avenue, Brooklyn, N. Y., in his advertisement in this issue calls attention to 1895 Post's Improved Eureka Sap Spout, of which illustrations are given. The manufacturer, it will be observed, calls special attention to the self-sealing Air Trap as being a means by which the flow of sap is materially increased.

THE STUART & PETERSON COMPANY, Burlington, N. J., have recently put on the market a line of Porcelain Lined Bathtubs, together with several other new articles, including Horse Feed Mangers with a salt receptacle. They are now making Glue Pots, known as Golden Crown, to the quality of which they refer. They have also added a better grade of Maslin Kettles, known as the Golden Crown.

SNOW FLAKE AXLE GREASE COMPANY, 1-7 Sudbury street, Boston, Mass., manufacturers of the well-known Snow Flake Axle Grease, are putting this article on the market in substantially the same form as heretofore, in cans varying in size from 1 quart to 5 gallons and in half barrel and barrel lots. The manufacturers claim that this grease will not gum and that it will keep forever in good condition if kept free from dirt. Besides being a lubricant, this grease, it is claimed, has medicinal properties

which make it a handy thing to have about a stable for use on sores, cuts, burns, &c. The article is put up in neat cans in the form known in the East as oyster cans, but with a slightly larger mouth and a convenient handle. For the Hardware trade, they have a special package of half a dozen quart size as a sample lot, and with this is sent a handsome lithograph showcard.

A. S. KING, for the past year representing the Jones Hollow Ware Company and the Auburn Hollow Ware Company of Baltimore, will after January 1 be identified with Matthai, Ingram & Co., Baltimore, Md., in connection with their New England trade.

UNDER DATE of the 1st inst., the corporate name of the Kenton Lock Mfg. Company, Kenton, Ohio, was changed to that of the Kenton Hardware Mfg. Company, the Board of Directors and officers continuing as heretofore. The object of the change in name being for the more thoroughly identifying the business carried on by the company with the class of goods produced. The former title conveyed the impression that nothing but Locks were being produced, while a full line of Builders' Hardware, Bronze and Brass Refrigerator Trimmings, Iron Toys and Iron, Brass and Bronze Novelties form an extensive factor in the concern's business. A new catalogue will shortly be issued which will be forwarded upon request.

It Is Reported—

Alabama.

That the firm of Johnson, Park & Co., Hardware, Bicycles, &c., SELMA, have dissolved.

That R. A. Posey, DADEVILLE, has removed his stock of Hardware, Implements, &c., into a new brick building recently completed.

That P. Walsh has entered the Hardware business at BIRMINGHAM.

That John P. Streety & Co. are a new Hardware firm at HAYNEVILLE.

Arkansas.

That the firm of Fox Bros., PINE BLUFF have just moved their retail and wholesale stocks into larger and more commodious quarters. The new store is excellently arranged. The office furniture, counters, shelving, bins, racks, &c., are of yellow pine and finished in hard oil. Fox Bros. will use the three-story building which has heretofore done service as their wholesale quarters for a warehouse for Wire, Nails, Iron and Stoves.

That Z. T. Stone has succeeded R. E. Beard in the Hardware and Stove business at GLENDALE.

District of Columbia.

That Albinson & Chase, whose store at 1722 Fourteenth street, WASHINGTON, was recently destroyed by fire, have rebuilt and are now ready for business.

Florida.

That L. B. Lee is the proprietor of a new Hardware store at TAMPA.

Illinois.

That W. B. Houck and C. L. Holton will engage in the Hardware business at TENNESSEE about January 1, under the style of Houck & Holton.

That John Bride will soon open a Hardware store at METAMORA.

That Weston & Wood have purchased the Hardware stock of Viner & Son, at MAZON.

That Edwards & Co. and Rigg & Campbell, CAMDEN, have sold their Hardware stocks to Thomas Keifer.

That J. H. Boone has recently entered the Implement business at TOLONA.

That BLOOMINGTON has a new Implement store, conducted by John T. Walton.

That Jacob White has purchased the Hardware stock of David Kendle, HAVANA, and is enlarging the business.

Indiana.

That A. P. Cleland, MACY, has added a repair shop to his Hardware business, where he will repair Bicycles and Pumps of all kinds and cut iron pipe. Repairs will also be kept for boilers and engines.

That the firm of Cadwallader & Bienz, Hardware, Harness, &c., WINGATE, has been dissolved. Mr. Bienz will continue the Hardware part of the business under his own name.

Iowa.

That J. C. Cunningham, WINFIELD, is moving into his new Hardware store.

That S. C. Bloom & Son, Hardware dealers, CARSON, who were recently burned out in a large fire at that place, have secured temporary quarters where they are doing business as usual.

That for the second time within three months the Hardware store of Louis Hassen, DAVENPORT, was robbed on the 9th inst. About \$100 worth of tools were carried off. It is supposed that both robberies were committed by the same parties.

That John Groetken & Co. have recently entered the Implement business at MERRILL.

That Van Tassel & Co., Hardware merchants, IONIA, have been succeeded by Troutner & Fallgater.

Kansas.

That the hardware store of Haynes Bros., EMPORIA, was entered by burglars on the 10th inst. and the safe doors blown open. The robbers secured about \$500 in cash, besides a quantity of Guns, Pistols, Ammunition, &c. A reward has been offered for their apprehension.

That Morris & Anderson, Hardware, HARNETT, have been succeeded by Anderson & Miller.

That J. W. Waggoner & Son are new Implement men at GREEN.

That B. W. Carter, Hardware dealer, MARION, has been succeeded by Evans & Co. W. H. Evans will have active charge of the business.

That F. M. Spalding has sold out his Hardware business, at MINNEAPOLIS, and will remove elsewhere.

That J. J. Blessington, Hardware, MORALE, has sold out.

That Lynch & Farrell, Hardware, Pumps and Windmills, WETMORE, have dissolved partnership. Mr. Farrell will continue the Hardware business, and Mr. Lynch that of Pumps and Windmills.

Maine.

That Joseph Fisher is putting in a stock of Hardware at SMYRNA. This is the first Hardware store in the vicinity.

That John A. Griffin, dealer in Stoves and Tinware, YARMOUTH, and C. S. Russell have gone into partnership under the firm name of Griffin & Russell. They will continue the Stove and Tinware business and also add a full line of Hardware.

That A. J. Sawyer's new Hardware building, at OLD TOWN, is rapidly approaching completion.

Massachusetts.

The Keith & Hiscock, EAST BROOKFIELD, will open a Stove and Hardware store in Mr. Keith's new block, which is nearly completed.

Michigan.

That William J. Loomis, Carson City, will job wheels as well as retail them during 1895. Mr. Loomis will have a line of wheels listing in price from \$60 to \$100. He has a contract with a factory by which a strictly high grade wheel will be made for him according to his specifications. This wheel will be marketed under the name of the "W. J. L. Special." Mr. Loomis

is also manufacturing a stick Grapholine chain lubricant, which he offers at an attractive price.

That Geo. C. Lindsley has purchased Frank E. Brown's interest in the Hardware business of Brown & Kishpugh, CLINTON.

That William Hart has purchased an interest in the Hardware business of Mr. Carncross, SENECA.

That D. H. Butler has bought B. E. McDermaid's Hardware business, at COLUMBIAVILLE.

Minnesota.

That C. N. Webb, Hardware merchant, of WEST CONCORD, has sold his stock of goods to H. Stockwell of OWATONNA.

That William W. Goble & Co., Hardware merchants, of CURRIE, have removed to FAIRVIEW, S. D.

Missouri.

That the store of the Sarcocie Hardware Company, WEBB CITY, was robbed on the 3d inst. About \$100 worth of goods were taken.

That Charles A. Chadwick has bought a half interest in the Hardware store of J. E. Landes, BRASHEAR.

New York.

That Charles E. Drake has opened a new Hardware store in the Drake Building, CORNING.

That J. J. Hall has purchased the Hardware stock of W. H. Burnett, at GLENS FALLS.

That Russell & Miller, BLOSSBURG, have sold their Hardware business to Frank Viel of that place.

That the Hardware store of Martin, Bing & Co., TARRYTOWN, was damaged by fire on the 9th inst.

Ohio.

That S. E. Bird's Hardware store, at MANSFIELD, was burglarized on the 7th inst.

That a large amount of Cutlery was stolen from the Hardware store of J. P. Fawcett, CANTON, on the 8th inst.

That Stanley E. Olcott of PERRY, MICH., has bought a one third interest in the Hardware firm of Loomis, Marble & Co., BOWLING GREEN. The style of the firm has been changed to Loomis, Marble & Olcott.

Pennsylvania.

That Bricker Bros., Hardware dealers, READING, have disposed of their Hardware stock to A. W. Goodrich of CLEARFIELD SPRING, MD., who is now in charge of the business.

That James Wagoner of GLEN MOORE is building a new Hardware store at that place.

That Bright & Lerch of READING are intending to erect a new Hardware building, the completion of which is expected during the early spring.

That the Hardware store of J. S. McKean & Sons, NEW KENSINGTON, was burglarized a short time since, and about \$200 worth of goods taken.

South Carolina.

That William Johnson is successor to Peoples & Johnson, NEWBERRY.

That G. H. Boyd & Co., Hardware dealers, LAURENS, have dissolved partnership. G. H. Boyd is successor.

South Dakota.

That the Healey Hardware Company of MITCHELL are intending to give special attention to the sale of Bicycles, and one of their employees will spend the winter at the shops of a leading manufacturer, where he will learn the business of repairing, returning in the spring to take charge of the company's Bicycle department.

That Wm. W. Goble & Co. of CURRIE, MINN., have removed their Hardware business to FAIRVIEW.

Tennessee.

That Maloon & Jeter, DRESDEN, have dissolved partnership.

That Geo. E. Spect & Son, MORRISTOWN, have succeeded Geo. E. Spect.

That Satterfield & Church, in the Hardware business at COLUMBIA, have sold out.

Texas.

That George West of MERKEL has commenced the erection of a new Hardware building.

That Adamson & Hancock, MEXIA, have been succeeded by B. J. Hancock.

That Ditto & Rudd, Hardware dealers, ARLINGTON, have been succeeded by Rudd & Son.

That Ernest Voelkel, SHELBY, has disposed of his business to Voelkel & Schultz.

Vermont.

That George I. Whitney has purchased Eugene Norwood's interest in the Hardware business at BELLOWS FALLS. Mr. Norwood will remove to NEW MEXICO, on account of his health.

Washington.

That burglars plundered the Hardware store of Woodhouse & Longuet, SEATTLE, on the night of the 5th inst. One hundred and fifty dollars' worth of Cutlery was carried off.

That an attempt was made on the 5th inst. to burglarize the Hardware store of E. R. Zimmer, at CENTRALIA. The would be robbers were, however, caught in the act and lodged in jail.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—No further changes of importance in prices have taken place, but the market still shows rather weak tone, and competition between sellers of new process, old process and foreign makes is quite keen. Large buyers are doing little, since there is no advantage in taking on more stock than may be needed to meet current demands, and the jobbing trade is rather slow, as usual at this season of the year. Foreign competition in Lead in Oil continues keen, and further contracts at 5¼¢ @ 5½¢ have been closed, chiefly for stock to be delivered during the first quarter of next year. There is a growing belief that foreign competition alone will force the combined American corrodors to make a further concession ere long. It is no secret that new process and mixed Lead manufacturers are not only pushing for business energetically, but name prices that look very low when contrasted with the official list of the combine.

Red Lead.—Sales have been moderate and the market is bare of distinctly new features. Orders are being placed in a very conservative way, owing to the free offering of foreign brands at low prices, spring delivery, and consequent belief that home producers will be forced to grant further concessions.

Litharge.—There has been no turn for the better in prices and business has been commonplace in the extreme. Low grade product used in the glass and rubber trade have probably fared better than the high grades, as far as volume of sales is concerned, but they continue low and irregular in price.

Orange Mineral.—A fair business has been done, but not enough to relieve the market from the weakish undertone that has characterized it for some

little time past. The statement that foreign manufacturers are sold well ahead does not harmonize with the fact that free offers are made for spring delivery at previous lowest rates.

Zincs.—Weakness still underlies the market for American Oxide and orders are being placed in an extremely conservative way. The former line of prices is generally quoted, but the list is sometimes shaded to capture desirable orders. Foreign brands are not quoted lower, but they are pushed for sale quite vigorously, and the market shows a rather weak tone.

Colors, &c.—In the market for dry Colors there is no change. Prices remain just about as they were a week ago, at all events, and neither manufacturers, importers nor jobbers report anything more than a moderate business. Oil Colors are selling in a moderate way only. The demand for Mixed Paints is extremely tame.

Oils and Turpentine.

Linseed Oil.—The market remains in a more or less unsettled condition, yet without radical change, and would indicate that some conditions or other have forced out of town crushers who are not in sympathy with the combine to make some concession. Thus several carloads have been sold at as low as 54¢ by New York State producers and nearly if not quite as low a rate was made on some other brands produced further westward. New York City crushers have not been at all alarmed, however, and still hold for the basis of 56¢ for domestic seed product, less usual allowance for packages. Trade has been only fair and the market is a narrow one, to say the best of it, with reasons leading to the suggestion that consumers have more to gain than to lose by going slow. A little foreign Oil comes forward, but not enough to have a direct or important influence upon the market.

Cotton Seed Oils.—Very little change in prices has taken place during the past week. The relation of supply and outlet seems to be more than usually problematical, but a somewhat relieving feature exists in the fact that prices are unusually low and liable to arouse the attention of both foreign and home trade buyers in a short time. Sales during the past week have been mainly on the basis of 24¢ @ 24½¢ for prime quality crude and 29¢ @ 29½¢ for prime summer yellow, early deliveries. Small quantities have been sold at only a moderate advance on those figures, which, along with active canvass for orders, would indicate that there is more than enough supply for the present outlet. Export buying has not been sufficient to carry any weight.

Lard Oil.—Almost stationary prices have prevailed, and the market has been quiet. That is to say, merely the ordinary turnover of goods has taken place, the most of which was at prices about the same as those that ruled a week ago. Toward the close, however, about 1 cent advance was asked for best city brands, and better figures were wanted also for favored Western brands.

Fish Oils.—In crude Menhaden, Sperm and Whale Oils no important deals have taken place and sellers' ideas as to values remain unchanged. The manufactured products, that is, pressed and bleached Oils, move off very fairly in a jobbing way at about former rates. Cod Oil is rather weak, owing to more or less pressure of Newfoundland sorts for sale: large buyers could probably secure concessions of about 2¢ from the popular quotations.

Spirits Turpentine.—Prices have averaged a fraction lower and the market is dull, with prices still leaning more or less in buyers' favor. Late business was at 27¼¢ @ 27½¢ for regular and 27¾¢ for machine barrels.

Improved Freezer Can and Hoop.

The cuts here shown represent improvements in the manufacture of ice cream freezers, introduced by North Brothers Mfg. Company, Philadelphia, for whom John H. Graham & Co., 113 Chambers street, New York, are agents. In Fig. 1 is shown a can, with a bottom made of heavy sheet steel, drawn into shape by presses. The lower edge of the body or side of the can is spun out to form a shoulder, against which the

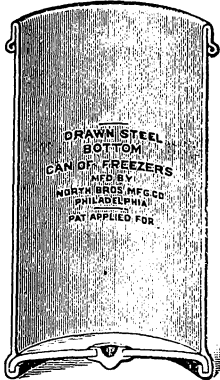


Fig. 1.—Drawn Steel Bottom Freezer Can.

bottom rests, and is then spun over the lower edge of the bottom. It is explained that the cans are made of fine quality bright charcoal tin plate of heavy gauge, and that they are folded and wired at the top, with a lock seam on the side, soldered both inside and outside. The manufacturers claim that the bottom cannot fall out or be displaced, that it cannot break and that it does not leak. Cans of this construction are used in their Lightning, Gem and Blizzard freezers. In Fig. 2 is

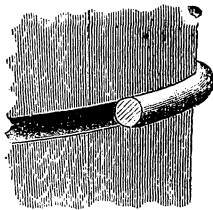
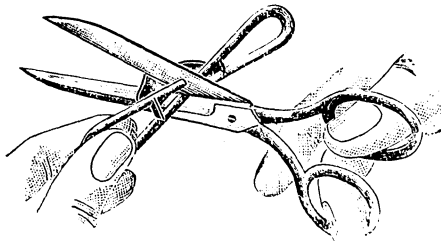


Fig. 2.—Electric Weld Wire Hoop.

shown the hoops used on the company's freezer pails. They are made of galvanized wire, welded by electricity and imbedded in grooves in the pail. The company claim that this style of hoop is twice as strong as the ordinary flat hoop, and are guaranteed by them not to fall off.

The Handy Scissors Sharpener.

The accompanying cut represents a scissors sharpener put on the market by Moore & Co., 64 Reade street, New



The Handy Scissors Sharpener.

York. The device consists of tempered steel wire bent in the form shown in the cut, measuring $2\frac{1}{2}$ inches over all.

Scissors are sharpened by cutting on the center bar, drawing the scissors entirely off the sharpener, at the same time pressing the sides of the blades against the two ends. The center bar is bent to correspond to the bevel of the edges of the blades, while the end

Milk Can Novelties.

The Chicago Stamping Company, Congress and Green streets, Chicago, have made a number of improvements in milk can stock, two of which are illustrated herewith. The first is a

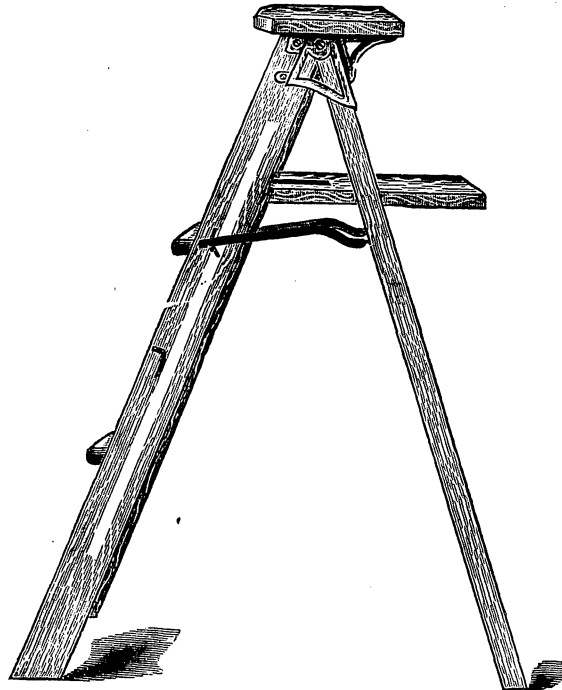


Fig. 1.—The Rivers Step Ladder.

pieces are designed to remove the burr formed in sharpening. Each sharpener is guaranteed by the manufacturer, who claims that scissors can be sharpened with it in 20 seconds. Each sharpener is packed in a neat box.

The Rivers Step Ladder.

The illustrations here shown relate to a step ladder, offered by the Rivers Step Ladder Mfg. Company, 806 Chestnut street, St. Louis, Mo. The ladder is built of selected material, and the hinge is of malleable iron. There is an arch brace fastening the steps to the uprights and the steps are grooved into the uprights, giving a supporting capacity, it is stated, of at least a thou-

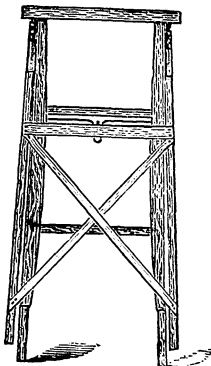


Fig. 2.—The Rivers Ladder Closed.

sand pounds. It is further stated that the hinge is safe and strong, and that it is so constructed that a person may walk to the top step without fear of the ladder breaking or of its giving away in any part. The manufacturers claim that the rear support, in connection with the construction of the other parts of the ladder, prevents any wobbling, and that the ladder is safe in all particulars. They also refer to the fact that it is sold at a low price.

new handle named the Improved Chicago Milk Can Handle. This is stamped from one piece of metal, and is so formed that it fits the hand perfectly and at the same time the metal drawn

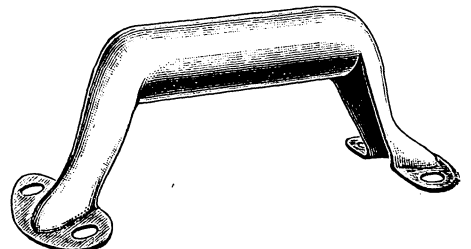


Fig. 1.—Improved Chicago Milk Can Handle.

under the handle makes a brace against the sides as a protection against jamming when the can is accidentally bumped. Extra heavy sheet metal is also used for the same reason. The handle is made of large size so that it can be readily grasped by hands covered with heavy mittens. The other improvement is a seamless rim setter can cover. This is for setter cans to be submerged. Covers for these cans, as heretofore made, have been shallow

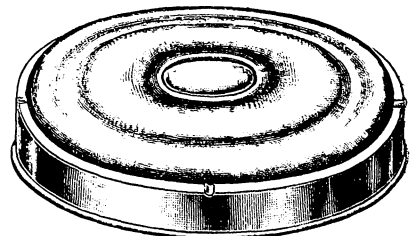


Fig. 2.—Seamless Rim Setter Can Cover.

and composed of two pieces. The new cover is stamped from one piece and is of such a depth that a much tighter fit is assured. These goods and others are shown in the company's new catalogue E, which has just been issued.

Straight Line Door Spring and Check.

The Upson Nut Company, Unionville, Conn., are introducing a door spring and check, as shown in the accompanying cuts. The spring is a round wire coil—a form, it is remarked, which has been proven to be the most durable of

straight line movement adds materially to the durability of the machine as well as to its efficiency and appearance. It is pointed out that the machine can be used upon any door, right or left hand, and as the machines are packed complete there can be no difficulty in attaching to the door. The turnbuckle attached to the lever can be instantly operated, and is for adjustment when-

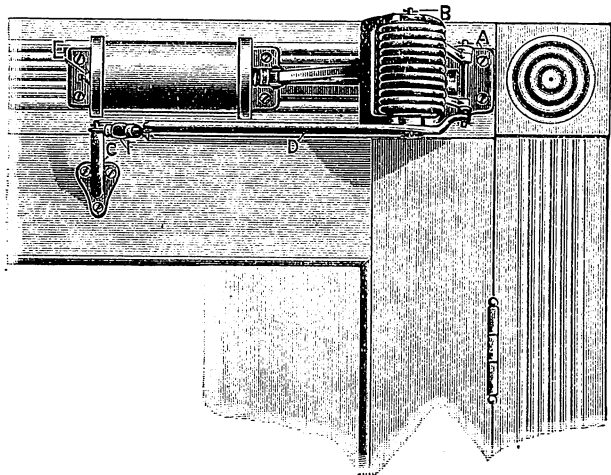


Fig. 1.—Straight Line Door Spring and Check.

all forms of springs—and so made as to exert its greatest force when the door is at the point of closing and the least force when the door is open. The check is formed by the cylinder, in which is a chamber with a moving piston, which, with suitable valves for its operation and adjustment, forms an air chamber to prevent the slamming of the door. Ordinarily the machine is placed on the

ever needed by reason of wear on the hinges of the door or of the machine. The manufacturers state that it has been their aim to construct a machine with special reference to the severe work required of a door spring and check, of simple and durable form and slightly in appearance, and they call attention to the points of excellence possessed by the machine, as follows: Simplicity of

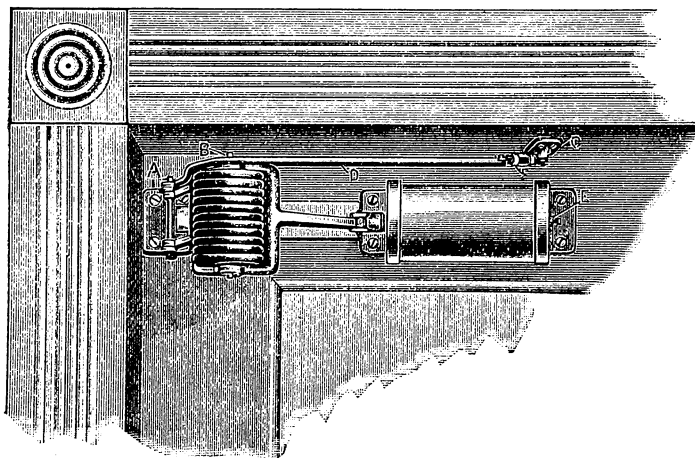


Fig. 2.—Door Spring and Check on the Door.

casing over the door, as in Fig. 1, or it may be placed on the door, as in Fig. 2, if preferred. In operation, it is explained, the opening of the door causes the piston rod to move upon the guide rod, depresses the spring, and, drawing the piston back, thus causes the front end of the cylinder to fill with air through a spring valve in the cylinder head. The closing of the door reverses the action of the machine, and the pressure of the piston in the cylinder causes, it is stated, a cushion of air, which escapes through another valve, as the adjustment of it may allow, thus closing the door as slowly as may be desired. The point is made that the movement of the machine is in a straight line with the cylinder, the piston being held perfectly in line by the action of the guide rod, which insures accuracy of movement with the least possible wear of the parts. It is remarked that the

construction and use; ease in attaching; facility of adjustment; perfect operation; great durability; unique appearance and reasonable cost. The Union Nut & Bolt Company, 107 Chambers street, are sole agents for the sale of the spring and check in New York.

The Spelman Saw Set.

J. H. Spelman, Cleveland, Ohio, is offering a saw set, combining a gauge, for cross cut saws, as shown in the accompanying cuts. The illustrations show the set full size, made of polished steel, with a thumb screw and lock bur at the lower end, as in Fig. 1. Around the tool above the thumb screw is a fixed ring of metal, which in the illustration is cut away to show the opening which receives the saw tooth when setting it. The piece of metal with a

beveled end inserted in the opening in the ring represents a saw tooth in position for setting. In operation the saw is placed in any suitable holder, back down, as for filing. The set is placed upon the tooth, as shown in Fig. 1, and the desired degree of set is obtained by adjusting the thumb screw, after which the lock bur is tightened to hold the thumb screw at that degree. A light blow or two is struck with a hammer upon the top of the tool to set the tooth. The manufacturer explains that a novel feature of the tool consists in a rounded bearing inside the ring, against which the tooth of the saw rests about midway its beveled pointed portion, whereby the metal of the saw below the point is packed and swaged as it is set, so that the set of the point is permanently fixed and the metal is hardened by impact or compression.

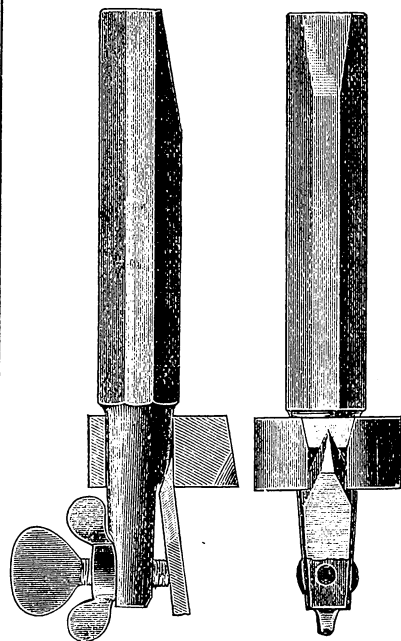


Fig. 1.—The Spelman Saw Set.

Fig. 2.—The Spelman Set as a Gauge.

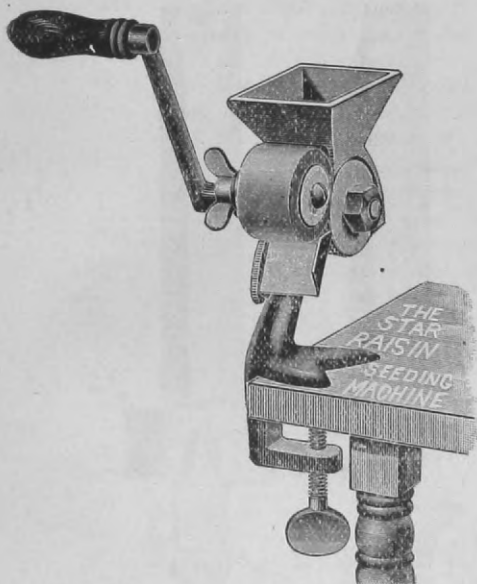
The manufacturer claims that the spring of the teeth is thus overcome, setting them uniformly and making them stay; that the teeth are not liable to break or crack in this method of setting, and that excessive or false set in a tooth is correctly reduced and taken out. Fig. 2 represents the saw laid down flat-ways, before setting, with a tooth inserted in an opening on the outside edge of the ring. The set is held in position with one hand, while with the other the incline of the tooth is filed away where the two bevels meet. This, it is explained, makes a third bevel running down the tooth centrally, reducing the thickness of the tooth toward the point. This filing, it is stated, allows the saw to work and cut more freely, as it makes a chisel tooth with three bevels, one on each side and one in the center. It is remarked that the edges at the extreme point should not be disturbed in this operation.

The Winchester Repeating Shot Gun, with 20-inch barrel, for use with buck-shot, is referred to as specially adapted as a protection from robbers, for home defense, guarding bank vaults, &c. It weighs 7½ pounds, is about 36 inches long over all, and is supplied in either the lever action or the model 1893, fore-end action. It is made by the Winchester Repeating Arms Company,

New Haven, Conn. It is convenient for Express messengers and train hands, watchmen and prison guards, police, and for use at home at night or in the dark, where one's aim is uncertain. There are six shots instantly available, five in the magazine and one in the barrel. Each shell is loaded with nine buckshot, and the whole can be discharged in six seconds or less. The penetration of these shot at 40 yards into pine wood is said to be about 4 inches, and at the same distance from the muzzle of the gun the shot will spread about 4 feet.

Star Raisin Seeding Machine.

A new machine has just been brought out for seeding raisins by F. H. Chase & Co., sole manufacturers, 51 and 53



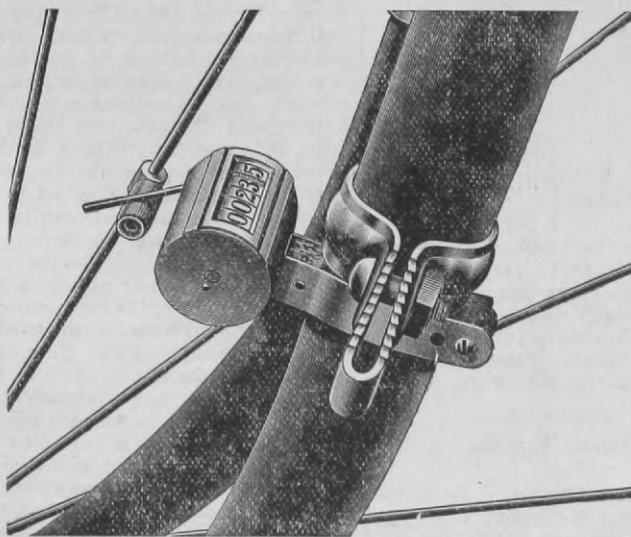
Star Raisin Seeding Machine.

South Jefferson street, Chicago. The machine is herewith illustrated. When attached to a table, the hopper stands a trifle over 4 inches above the top of the

chute in front of the machine, while the fruit drops under it. The chute has a knife edge at the top to assist in the separation of the seeds from the fruit. It is also capable of adjustment by means of a screw. Loose ribs projecting from between the cutters on the toothed cylinder prevent the fruit from being carried back on the cylinder, but make it drop below. The machine is very simple, is easily cleaned, and all parts are tinned to prevent rust. The manufacturers state that no soaking of raisins is required, but that the machine will seed them dry, which is a point appreciated by cooks.

United States Cyclometer.

Bean & Lang, Fond du Lac, Wis., are putting on the market the cyclometer illustrated in the accompanying cut. The cyclometer clamps on the fork of the machine just below the coaster, located, it is remarked, where it is out of the way and safe from harm. It is described as being 1 inch long, $\frac{7}{8}$ -inch in diameter, and as weighing 1 ounce. It registers 10,000 miles and repeats or may be set back. The right-hand wheel of the dial shows tenths, and is separated from the others by a thin gear wheel. The figures in the illustration read 23 $\frac{5}{10}$ miles. The point is made that the figures can be plainly read from the saddle, and that they read in a straight line. The manufacturers state that the meter is as nearly dust and water proof as it is practicable to make it; that should a little dust work in it will settle to the bottom and do no harm, and that water in any quantity cannot injure it, as all parts are made of non-corrosive materials. The meter may be cleaned by removing the end of the case. It is explained that all exposed parts of the meter are of solid nickel silver, and that all springs and wearing parts are of the best quality of phosphor bronze. It is stated that to insure perfection every meter is run at least 400 miles on a testing machine, at the rate of 50 to 60 miles an hour. The manufacturers claim that the meter is perfect in



U. S. Cyclometer.

table. The seeding is accomplished by a toothed cylinder, the raisins passing between it and a rubber roll. The roll can be set loosely or close to the teeth by means of the thumb screw shown in the cut. The seeds are delivered down

mechanism, accurate, durable, noiseless, and that it is not liable to injury. The meter may be changed, it is stated, from a 28 to a 30 inch wheel, or *vice versa*, by changing one piece in the meter, which will be provided at a

slight additional cost. The meters are sent from the factory for a 28 or 30 inch wheel, as ordered.

Improved Form of Victor Pedal.

The accompanying cuts show the form of pedal used by the Overman Wheel Company, Chicopee, Mass., on

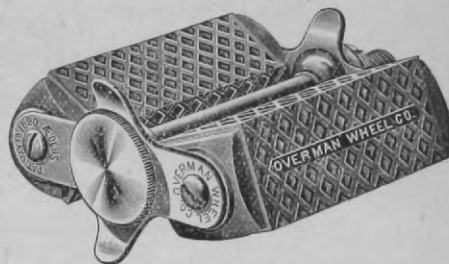


Fig. 1.—Victor Square Rubber Pedal.

their 1895 Victor wheels. The pedals are rights and lefts, the left pedal axle being provided with a right hand thread, and the right pedal axle with a left hand thread. The pedal axle is screwed into the crank and held by an adjusting cone. It is explained that the action of pedaling tends to tighten rather than to loosen the connection, and that by securing the pedal axle directly to the crank the usual pedal nut is dispensed with and the tread narrowed by the width of the nut. The

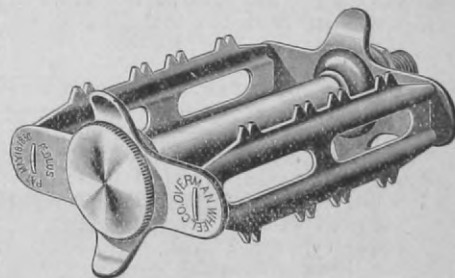


Fig. 2.—Victor Rat Trap Pedal.

adjusting cone has a hexagonal head, and, when turned back against the crank face, forms an efficient lock. A dust cap screwed to the outer pedal end protects the bearing. To change from the rubber to rat trap pedals, or *vice versa*, the dust cap is unscrewed, which discloses a slot in the end of the pedal axle. The adjusting cone is then loosened, and, with a small coin inserted in the slot of the pedal axle, the axle may be unscrewed from the crank.

THE BUSINESS of Jobbing Hardware, Iron, Paints, Oils and General Store Supplies, now carried on at 126 and 128 Exchange street, Bangor, Maine, by the Haynes & Chalmers Company, Incorporated, was established in 1868 by Haynes & Pillsbury, and Mr. Haynes of the present concern was the senior member of the old firm. The growth of the business has necessitated taking in stores in the rear and the upper floors of buildings on either side, so that now there are 20,000 feet of connected floor space and outside storehouses, which add almost as much more to the available room. Besides carrying a large variety of goods from all parts of the country, this concern handle exclusively the Moses Weld Pattern Axe, which is a favorite with lumbermen everywhere.

Empire Double Acting Force Pumps.

The Goulds Mfg. Company, Seneca Falls, N. Y., are introducing double acting force pumps, as shown in the accompanying cuts, adapted to use in shallow wells, 'deep wells, drive wells

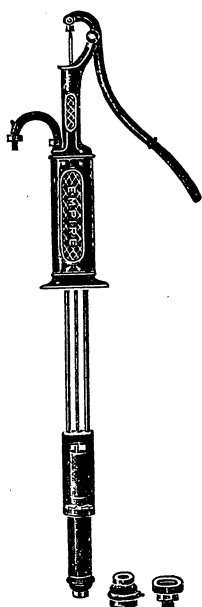


Fig. 1.—Empire Double Acting Well Force Pump.

or casing wells. The pump consists of a standard with the bearer top in one piece, cast in two half sections, strongly bolted and holding securely in place the two supporting pipes which form respectively the air chamber and discharge pipes connecting with the upper cylinder, as in Figs. 1 and 3. Fig. 1 shows the pump arranged for shallow wells, and Fig. 3 the pump arranged for deep wells. It is stated that the upper cylinder, Fig. 2, is brass lined and has a differential plunger, giving one-half the displacement of the lower

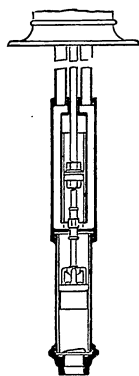


Fig. 2.—Detail of Cylinder for Shallow Wells.

working cylinder and contributing to an even and uniform discharge of water. It is pointed out that all stuffing boxes or glands are dispensed with by this construction; that all undue friction is avoided, and that an easy working pump is secured. For lower working cylinder either the company's standard pattern iron brass lined cylinder or their brass body cylinder is used to adapt pumps

for shallow wells of 25 to 30 feet, or for deep wells of 75 to 100 feet. Unless otherwise ordered, all Empire pumps are shipped put up for shallow wells as in Fig. 1, with the lower working cylinder screwed into the upper cylinder, and the universal bushing for the bottom of the upper cylinder and the top attachment for the lower cylinder tied on. To adapt the pump for deep wells the lower cylinder is unscrewed from the upper cylinder and the universal bushing is attached to the bottom of the upper cylinder, and the top cap is attached to the lower cylinder, and the cylinders are connected with the pipe and rod required for any depth of well, as shown in Figs. 3 and 4. In addition to the universal bushing a strainer and

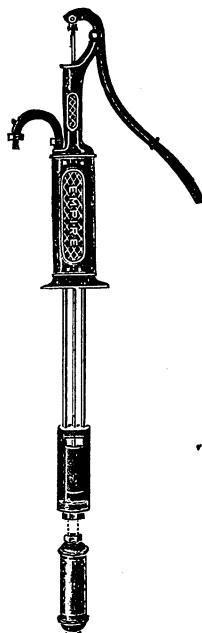


Fig. 3.—Empire Double Acting Well Force Pump.

hose connection are furnished with each pump, for which no extra charge is made. The selection of an Empire pump, it is remarked, is governed by the style of the bearer top wanted and whether a three-way cock with a rod

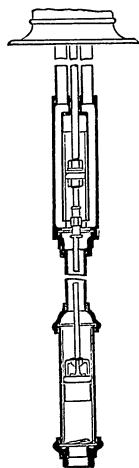


Fig. 4.—Detail of Cylinder for Deep Wells.

for distributing the water may be required. In other particulars, it is stated, the pump may be adapted for various uses, as already explained.

CONTENTS.

	PAGE
The Ferracute Double Action Drawing Press. Illustrated.....	1103
Duluth News.....	1104
Relative Tests of Cast Iron. Illus.....	1105
The Perfection Friction Clutch. Illus.....	1109
The Manufacture of Tubular Articles. Illustrated.....	1110
Open Hearth Steel.—IV. Illustrated.....	1111
San Francisco News.....	1114
The Walrand Steel Process as Applied to Cast Steel Horseshoes.....	1114
Fall Meeting of the Alabama Scientific and Industrial Society.....	1115
Trade Publications.....	1116
Washington News.....	1117
The Week.....	1117
Editorials:	
Fraudulent Shipments.....	1118
The Decision in the Debs Case.....	1118
Poor Crop Outlook.....	1118
The Russian Armor Plate Contract.....	1119
The Return of American Securities Held Abroad.....	1119
Obituary.....	1119
Correspondence.....	1120
Currency Reform.....	1120
Personal.....	1121
Manufacturing:	
Iron and Steel.....	1121
Machinery.....	1121
Hardware.....	1122
Miscellaneous.....	1122
The Iron and Metal Trades:	
Philadelphia.....	1123
Chicago.....	1123
Louisville.....	1124
Pittsburgh.....	1125
Cincinnati.....	1126
St. Louis.....	1126
Metal Market.....	1126
New York.....	1127
Financial.....	1127
British Metal Market.....	1128
Birmingham.....	1128
Hardware:	
Condition of Trade.....	1129
Notes on Prices.....	1130
National Hardware Association.....	1131
The Annual Stock-Taking.....	1137
Taking Stock.....	1138
New England Iron and Hardware Association.....	1139
Travers Bros. Company Hammock Suits.....	1139
Bicycle Notes.....	1139
Selling to Consumers.....	1140
Window Displays of Sporting and Athletic Goods.....	1140
Aluminum Cooking Utensils.....	1141
Inventory Taking.....	1142
Trade Items.....	1143
It Is Reported.....	1143
Paints and Colors.....	1144
Improved Freezer, Can and Pail. Illus.....	1145
The Handy Scissors Sharpener. Illus.....	1145
The Rivers Step Ladder. Illustrated.....	1145
Milk Can Novelties. Illustrated.....	1145
Straight Line Door Spring and Check. Illustrated.....	1146
The Spelman Saw Set. Illustrated.....	1146
Star Raisin Seeding Machine. Illus.....	1147
United States Cyclometer. Illus.....	1147
Improved Form of Victor Pedal. Illus.....	1147
Empire Double Acting Force Pumps. Illustrated.....	1148
Current Hardware Prices.....	1149
Current Metal Prices.....	1156

Current Hardware Prices.

DECEMBER 19, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic, 3 doz. \$3.00... 33% @ 39% & 10%
Excelsior, 3 doz. \$10.00... 50% @ 10% & 2%
North's... list net @ 10%
Zimmerman's—See Fasteners, Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvils, 7 lb. 9¢... 15% @ 15% & 5%
Horseshoe brand, Wrought... 9% @ 10% & 5%
Barnes Mfg. Co... 50%

Imported—

Armitage's Mouse Hole... 8% @ 9% & 4¢
S. & H. machine finished... 9% @ 10% & 4¢
Trenton... 20%
Peter Wright's... 6% @ 10% & 4¢

Anvil, Vise and Drill—

Allen Anvil and Vise, \$3.00... 40% @ 10%
Cheney Anvil and Vise... 25%
Millers Falls Co., \$18.00... 30%
Holt's... 40% @ 40% & 10%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Common Augers and Bits, 70% @ 10% & 75% & 5%
Boring Machine Augers... 70% @ 10% & 75% & 5%
Car Bits, 12-in. twist... 50% @ 50% & 10%
Cincinnati Bell-Hangers' Bits... 40%
Forstner Pat. Auger Bits... 40% @ 40% & 10%
Jennings' Pattern Augers and Bits... 40%
Jennings' Pattern Auger Bits... 60% @ 60% & 10%
C. E. Jennings & Co., No. 10 extension... 40%
C. E. Jennings & Co., No. 30... 60%
C. E. Jennings & Co., Auger Bits, 3 set 3/4 quaters, No. 5, 8, 10, 30, \$3.50 set... 25%
Russell Jennings' Augers and Bits... 25%
Lewis' Patent Single twist... 45%
L'Hommedieu Car Bits... 15% @ 10%
Pugh's Black... 20%
Pugh's Jennings Pattern... 30%
Snell's Bits... 60% @ 10% & 60% & 10% & 5%

Bit Stock Drills—

Cleveland... 50% @ 10% & 5%
Morse Twist Drills... 50% @ 10% & 5%
New Process Twist Drill Co... 60% @ 10%
Standard... 40% @ 40% & 10%
Syracuse, for metal... 50% @ 50% & 10%
Cincinnati, for metal... 30% @ 10% & 40%
Syracuse, for wood (wood list) 30% @ 10% & 40%

Expansive Bits—

Clark's small, \$18; large, \$26... 40% @ 40% & 5%
Ives' No. 4, 3 doz. \$80... 40% @ 40% & 10%
Stearns' No. 1, \$20; No. 2, 18... 40% @ 40% & 10%
Stearns' No. 2, \$18... 20%
Swan's... 40% @ 40% & 10%

Gimlet Bits—

Bee... 25% @ 25% & 10%
Common... 3¢ gr. \$2.50 @ 3.00
Diamond... 40% @ 10%
Diamond Cut... 40% @ 10%
Hartwell's, 3¢ gr. \$10.00... 40% @ 10%
Douglass... 40% @ 10% & 5%
Ives... 60% @ 10% & 60% & 10% & 5%
Shepardson's... 45% @ 10% & 45% & 10% & 5%

Hollow Augers—

Bonney's Adjustable... 3¢ doz. \$21.00
Cincinnati Adjustable... 25% @ 10%
Cincinnati Standard... 25% @ 10%
Douglass... 33% @ 33% & 10%
French, Swift & Co. (Beecher)... 33% @ 33% & 10%
Ives' Expansive, each, \$4.50... 30% @ 5%
Stearns... 20% @ 10%
Universal Expansive, each \$4.50... 20%
Wood's, 3¢ doz. \$48... 25% @ 10%

Ship Augers and Bits—

L'Hommedieu's... 15% @ 10% & 15% & 10% & 5%
Snell's... 25% @ 25% & 10%
Snell's Ship Auger Pattern Car Bits... 15% @ 10% & 15% & 10% & 5%
Watrous... 25% @ 25% & 10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled... 3¢ gr. \$2.50 @ 3.00
Brad, Shouldered... 3¢ gr. \$1.30 @ 1.40
Peg, Pat... 3¢ gr. 35¢ @ 38¢
Peg, Should... 3¢ gr. \$1.50 @ 1.55
Scratch, Handled... 3¢ gr. \$4.00 @ 4.50
Scratch, Socket... 3¢ doz. \$1.10 @ 1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands... \$5.50 @ 6.00
First quality, other brands... \$5.00 @ 5.50
Beveled, add 50¢ @ doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common... 3¢ }
No. 2 Common... 3¢ }
Nos. 7 to 14... 7¢ }
Nos. 15 to 18... 47¢ } 3¢ cash
Nos. 19 to 22... 70¢ }
Concord, local... 44¢ }
Concord, solid collar... 49¢ }

Bag Holders—See Holders, Bag.

Balances—

Caldwell, low list... 30%
Pullman... 40%
Sensible... 60%

Spring—

Spring Balances... 40% @ 10% & 50%
No. 2000... 20 30
Chatillon, 3 doz. \$0.80 .95 1.75 net
Chatillon Straight Balances... 40% @ 40% & 10%
Chatillon Circular Balances... 50% @ 10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel... 2¢ @ 2 1/2¢ & 3¢
Iron, Steel Points... 2¢ @ 2 1/2¢ & 3¢

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2 in., \$1.80;
12-inch, \$2.00; 13 1/2-inch, \$2.50.

Beams, Scale—

Scale Beams, List Jan. 12, '82... 60% @ 10% & 50% & 10% & 5%
Chatillon's No. 1... 40%
Chatillon's No. 2... 50% @ 10% & 50% & 10% & 5%
Custers', doz. lots... 33%

Beaters—

Egg—
Bryant's... 3¢ gr. \$14.00
Double (H. & R. Mfg. Co.)... 3¢ gr. No. 0, \$12.00; No. 1, \$15.00; No. 2, \$36.00
Dover... 3¢ doz. \$1.00; 3¢ doz. \$1.50
Dover, Ex. Family size... 3¢ doz. \$3.50
Dover (Standard Co.)... 3¢ doz. \$1.00
Duplex (Standard Co.)... 3¢ doz. \$1.00
Duplex Extra Heavy (Standard Co.)... 3¢ doz. \$3.50
Easy (H. & R. Mfg. Co.)... 3¢ gr. \$12.00
Improved Acme (H. & R. Mfg. Co.)... 3¢ gr. \$9.00
Silver & Co... 3¢ doz. \$4.50
Spiral... 3¢ gr. \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.)... 3¢ gr. \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2... 20%
Bells—
Cow—
Common Wrought... 60% @ 10%
Kentucky Durham... 70% @ 10%
Kentucky, Sargent's list... 70% @ 10%
Kentucky "Star"... 20% @ 10%
Texas Star... 50% @ 10%
Western, Sargent's list... 70% @ 10%

Door—

Crank, Brooks... 50% @ 10% & 2%
Crank, Cone's... 10%
Crank, Cone's... 20% @ 10%
Gong, Abbe's... 33% @ 10%
Gong, Barton's... 40% @ 10% & 50%
Gong, Yankee... 45% @ 10%
Lever, R. & E. Mfg. Co.'s... 50% @ 10% & 2%
Lever, Sargent's... 60% @ 10%
Lever, Taylor's Bronzed or Plated... net
Lever, Taylor's Japanned... 25% @ 10%
Pull, Brooks... 50% @ 10% & 2%

Electric—

Bigelow & Dowse... 40% @ 40% & 10%
Wollensak's... 40% @ 40% & 10%

Hand—

Extra Heavy Brass... 70%
Light Brass... 70% @ 10% & 70% & 10% & 5%
Silver Chime... 33% @ 10%
White... 70%
Globe (Cone's Patent)... 25% @ 10% & 35%

Miscellaneous—

Call... 50%
Farm Bells... 2¢ @ 2 1/2¢
Steel Alloy Church and School Bells... 50%

Bellows—

Blacksmiths... 70% @ 70% & 5%
Hand Bellows... 50% @ 10% & 50% & 10% & 5%
Molders... 50% @ 10% & 50% & 10% & 5%

Belt, Rubber—

Common Standard... 75% @ 10% & 75% & 10% & 5%
Extra... 60% @ 10% & 5%
Standard... 70% @ 10% & 75%
N. Y. B. & P. Co., Carbon... 60% @ 10% & 5%
N. Y. B. & P. Co., Double Diamond... 60%
N. Y. B. & P. Co., 1846 Para... 40% @ 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15... 45%
Detroit Perfected Tire Bender... 15% @ 15% & 10%
Green River Tire Benders and Upsetters... 20%
Stoddard's Lightning Tire Upsetters... 15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.
Bit Holders—See Holders.
Blind Adjusters—See Adjusters, Blind.
Blind Fasteners—See Fasteners, Blind.
Blind Staples—See Staples, Blind.
Blocks—
Cleveland Block Co., Mal. Iron... 50% @ 10% & 60% & 10%
Moore's Novelty, Mal. Iron... 60%
Sure Grip Steel Tackle Blocks... 25% @ 25% & 10%
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—
Com., list June 10, '84... 80% @ 25%

Genuine Eagle, Norway, list Oct. '84... 80% @ 80% & 10% & 5%

Eagle, Norway, list Oct., '84... 80% @ 80% & 10% & 5%
Phila. pattern, list Oct. 7, '84... 70%
R. B. & W. list... 80% @ 25%
Bolt Ends, list Jan. 1, '90... 80% @ 25%
Machine, list Jan. 1, '90... 80% @ 25%

Door and Shutter—

Cast Iron Barrel, Square, &c... 75% @ 10% & 75% & 10% & 5%
Cast Iron Chain (Sargent's list)... 65% @ 10% & 65% & 10% & 5%
Cast Iron Shutter Bolts... 75% @ 10% & 75% & 10% & 5%
Ives' Patent Door... 80% @ 10% & 80% & 10% & 5%
Wrought Barrel... 75% @ 10% & 80%
Wrt B. K. Flush Common... 80% @ 10% & 80% & 10% & 5%
Wrt Shutter, Brass Knob... 50% @ 10% & 60%
Wrt Shutter, Sargent's list... 60% @ 70%
Wrt Shutter, all Iron, Stanley's... 66% @ 70%
Wrought Square... 75% @ 10% & 80%
Wrt Sunk Flush, Sargent's list... 60% @ 10%
Wrt Sunk Flush, Stanley's list... 60% @ 60% & 10%

Stove and Plow—

Plow... 60% @ 10% & 60% & 10% & 10%
Stove... 70% @ 70% & 10%
R. B. & W. Plow... 55%

Tire—

Common, list Feb. 28, '83... 70% @ 10%
American Screw Company... 70% @ 10%
Norway, Phila., list Oct. 16, '84... 75% @ 10%
Eagle, Phila., list Oct. 16, '84... 80% @ 10%
Bay State, list Feb. 28, '83... 70% @ 10%
Franklin Moore Co... 70% @ 10%
Norway, Phila., list Oct. 16, '84... 75% @ 10%
Eagle, Phila., list Oct. 16, '84... 80% @ 10%
Eclipse, list Feb. 28, '83... 70% @ 10%
Port Chester Bolt & Nut Company... 70% @ 10%
Empire, list Feb. 28, '83... 70% @ 10%
Keystone, Phila., list Oct. '84... 80% @ 10%
Norway, Phila., list Oct. '84... 75% @ 10%
R. B. & W., Phila., list Oct. 16, '84... 85%

Borers, Tap—

Common and Ring... 20% @ 10%
Clark's... 33% @ 35%
Enterprise Mfg. Co... 25%
Ives' Tap Borers... 33% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's... 40%

Boxes, Wagon—

Per lb... 23¢

Boxes, Miter—

Spilker's Excelsior, 3-in., \$7.50; 4-in., \$8.50; 5-in., \$13.00; 6-in., \$15.00... 20%

Braces—

NOTE.—Most Braces are sold at net prices.
Barber's... 50% @ 10%
Armstrong's... 50% @ 10%
Combs Patent, American... \$1.00 @ 1.10
Davis Patent... 50% @ 10%
Fray's Genuine Spifford's... 50% @ 10% & 5%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414... 50% @ 10% & 5%
Ives' New Haven Novelty... 70% @ 70% & 5%
New Haven Ratchet... 60% @ 50% & 60% & 10%
Barber's Ratchet... 60% @ 50% & 60% & 10%
Barber's... 60% @ 50%
Spifford... 60% @ 50% & 60% & 10%
P. S. & W. Co., Peck's Patent... 60%
Rose & Johnson... 50%

Brackets—

Shelf, fancy... 70% @ 70% & 10%
Sargent's list... 70% @ 70% & 10%
Other makes at a wide range of prices.
Shelf, plain... 65% @ 70%
Regular, list... 60% @ 10% & 70% & 10%
Bradley Shelf Brackets... 75%

Bright Wire Goods—See Wire.

Broilers—

Hen's Self-luch... 9 10 9x11
Basting... Per doz. \$4.50 5.50 6.50
Morgan Odorless... doz. \$12... 50%
New Haven... 50%
Wire Goods Co... 60% @ 10%

Buckets, Well and Fire—See Pails.

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers, Butchers'.

Butts—

Cast Brass, Fast... 33% @ 10% & 33% @ 10%
Cast Brass, Loose... 33% @ 10%
Cast Brass, Tiebout's... 50%
Wrought Brass... 80% @ 10% & 80% & 20%

Cast Iron—

Fast Joint, Broad... 80% @ 10% & 80% & 10% & 10%
Fast Joint, Narrow... 60% @ 60% & 10%
Loose Joint... 75% @ 10%
Loose Joint, Japanned... 75% @ 10%
Loose Joint, Jap., with Acorns... 75% @ 10%
Loose Pin, Acorns... 75% @ 10%
Loose Pin, Acorns, Japanned... 75% @ 10%
Loose Pin, Acorns, Japanned, Plated Tips... 75% @ 10%
May's Hinges... 75% @ 10%
Parliament Butts... 75% @ 10%

Wrought Steel—

Fast Joint, Broad... 75% @ 10%
Fast Joint, Narrow... 75% @ 10%
Fast Joint, Lt. Narrow... 75% @ 10%
Inside Blind, Light... 75% @ 10%
Inside Blind, Regular... 75% @ 10%
Loose Joint, Broad... 75% @ 10%
Loose Pin... 75% @ 10%
Table Butts, Back Flaps &c... 75% @ 10%

Brackets—

Shelf, fancy... 70% @ 70% & 10%
Sargent's list... 70% @ 70% & 10%
Other makes at a wide range of prices.
Shelf, plain... 65% @ 70%
Regular, list... 60% @ 10% & 70% & 10%
Bradley Shelf Brackets... 75%

Bright Wire Goods—See Wire.

Broilers—

Hen's Self-luch... 9 10 9x11
Basting... Per doz. \$4.50 5.50 6.50
Morgan Odorless... doz. \$12... 50%
New Haven... 50%
Wire Goods Co... 60% @ 10%

Bronzed Wrought Butts... 50% @ 10% & 50% & 10% & 5%

Cages, Bird—

Hendryx, Brass:
9000, 5000, 1100 series... 10%
1200 series... 40%
200, 300, 600 and 900 series... 40% @ 10% & 50%
Hendryx Bronze:
700, 800 series... 40% @ 10% & 50%
Hendryx Enamelled... 40% @ 10% & 50%

Calipers—See Compasses.

Calks, Toe—

Burke's, One Prong, Blunt... 4 1/2¢ @ 5¢
Burke's, One Prong, Sharp... 5 1/2¢ @ 6¢
Burke's Two Prong, Blunt... 5 1/2¢ @ 6¢
Burke's Two Prong, Sharp... 6 1/2¢ @ 7¢
Gautier, One Prong, Blunt... 5 1/2¢ @ 6¢

Can Openers—See Openers, Can.

Cans, Milk—

S. S. & Co.: 5-gal. \$3.00; 8-gal. \$4.40;
10-gal. \$4.75 each... 40% @ 10%

Cans, Oil—

Galvanized Blue Band, 1-gal., 3 doz. \$2.25
Galvanized Blue Band, 5-gal., Tip-Top... 3¢ doz. \$12.00
Galvanized Blue Band, 5-gal., Faucet... 3¢ doz. \$8.00
Glass Oil, Friend... 3¢ doz. \$2.75

Caps—

Percussion—
Eley's E. B... 52¢ @ 56¢
Hicks & Goldmark's and Union Metallic Cartridge Co... 1000
E. B. Grind Edge, Cent. Fire, 1-10's... 47¢ @ 50¢
E. B. Trimm'd Edge, 1-10's... 47¢ @ 50¢
F. L. Waterproof, 1-10's... 35¢ @ 37¢
G. D... 27¢ @ 30¢
Musket, Waterproof, 1-10's... 50¢ @ 52¢
S. B. Genuine Imported... 45¢

Primers—

Berdan Primers, \$1.00... 2¢
E. L. Caps (Sturtevant Shells) \$1.00... 2¢
All other primers, \$1.20... 2¢

Cards—

Watson's Cotton Wool, Horse and File, list Jan. 23, '91... 10%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con. Ball, Swgd... \$1.85 @ 1.90
B. B. Caps, Round Ball... \$1.60 @ 1.65
Blank Cartridges, except 22 and 32 cal. additional 10% to above discounts.
Blank Cartridges, 22 cal. \$1.75... 2¢
Blank Cartridges, 32 cal. \$3.50... 2¢
Cent. Fire, Military and Sporting... 15¢ @ 25¢
Cent. Fire, Pistol and Rifle... 25¢ @ 52¢
Chimed Shells and Bullets... 15¢ @ 52¢
Rim Fire Cartridges... 50¢ @ 52¢
Rim Fire, Military... 15¢ @ 25¢

Chisels—**Socket Framing and Firmer**

Ohio Tool Co.	80@80&10%
P. S. & W.	
Witherby	
Buck Bros.	30%
Charles Buck	30%
Douglas	75@75&10%
Merrill	60&10@60&10&10%
L. & I. J. White	30@30&5%

Tanged and Miscellaneous

Buck Bros.	30%
Charles Buck	30%
Butchers	\$4.75 to \$5.00 to 2
Spear & Jackson's	\$5 to 2
Tanged Firmers	50@50&10%
L. & I. J. White, Tanged	25&5%
Cold Chisels, fair quality	7 14@10%

Chucks

Beach Pat.	each \$8.00	20%
Danbury	each \$6.00	30@30&5%
Graham Patent		33%
Morse's Adjustable	each \$7.00	20@20&5%
Syracuse, Balz Pat.		25%
Skinner Patent Chucks		40%
Combination Lathe Chucks		25%
Drill Chucks		25%
Independent Lathe Chucks		20%
Planer Chucks		20%
Universal Lathe Chucks		40%
Union Mfg. Co.		40%
Combination		40%
Independent		40%
Universal		40%
Victor	\$8.50	25%

Churns

Adjustable, Hammars'.....	15@15&5%
Adjustable, Stearns'.....	30@30&10%
Barnes' Malleable Screw and Cabinet.....	50%
Barnes' Machinists' Clamps.....	33 1/3%

Clamps

Adjustable Cincinnati	25&10%
Adjustable Hammers	15@15&5%
Adjustable Stearns	30@30&10%
Barnes' Malleable Screw and Cabinet	50%
Barnes' Machinists' Clamps	33%
Cabinet, Sargent's	70&10%
Carpenter's Cincinnati	25&10%
Carriage Makers, P. S. & W. Co.	40&10%
Carriage Makers, Sargent's	75@75&5%
Eberhard Mfg. Co.	40&5@40&5%
Joiners' Clamps, Tatum's	25&10%
R. I. Tool Co.'s Wrought Iron	25%
Saw Clamps, see Vises, Saw Filers	
Stearns' Malleable, with Wrought Iron	75@75&5%
Screw	75@75&5%
Stearns' Steel	25%
Warner's	40&10@40&10&5%

Cleavers, Butchers'

Beatty's	40&5@40&10%
Bradley's	25@30%
Foster Bros.	30%
New Haven Edge Tool Co.'s	30%
Nichols Bros.	30%
P. S. & W.	33&5@33&5%
Schulte, Lohoff & Co.	40@40&5%
L. & I. J. White	25%

Clips

Baker Axle Clips	25&10%
Norway Axle	70&10%
Norway Spring B. Clips	60&10&10%
2d grade Norway Axle	70&5@70&10%
Steel Helio Clips	70@40&10%
Superior Axle Clips	70@70&5%
Wrought Iron Helio Clips	70@40&10%

Cloth and Netting, Wire**Cockeyes****Cocks, Brass**

Hardware List (Globe, Kerosene, Lever	
Bibbs, Racking, &c.)	60&10&10&2%

Coffee Mills—See Mills, Coffee.**Collars, Dog**

Brass, Pope & Stevens' list	40%
Chapman Mfg. Company, new list	40%
Embossed Gift, Pope & Stevens' list	30&10%
Leather, Pope & Stevens' list	40%
Medford Factory Goods Co.	40&10@50%

Combs, Curry

American Curry Comb Co.	33&40%
Fitch's	50&10@50&10&10%
Gibb's Magnetic	40% doz. \$2.00
Kohler's Humane	40% doz. \$1.75
Kohler's Magic Oscillating	40% doz. \$2.00
Rubber	40% doz. \$7.50

Compasses, Dividers, &c.

Compasses, Calipers, Dividers, 70&10@75%	
Bemis & Call Co.'s	
Dividers	65%
Calipers, Call. Patent Inside	65%
Calipers, Double	65%
Calipers, Inside or outside	65%
Calipers, Wing	60%
Compasses	50&5%
Excelsior	50%

Starrett's

Combination Dividers	25%
Lock Calipers and Dividers	25%
Spring Calipers and Dividers	25&10%
Stevens & Co.'s	25&10%

Coolers Water

S. S. & Co.	2-gal. \$3.40; 3-gal. \$4.00;
4-gal. \$4.50; 6-gal. \$5.60 each	60%

Coopers' Tools**Cord**

Braided, Crown Drab and Fancy	30%
Braided, Crown White	50%
Cable Laid Italian Sash	19@20%
Common	8@9&9%
Common Russia Sash	12@13%
Egyptian, India Hemp, Braided	26%
India Cable Laid Sash	11@12%
Massachusetts, White	21@22%
Ossawa Mills	

Crown, Solid Braided White	22%
Crown, Drab and Fancy	22%
Braided Giant, Drab and Fancy	30%
Braided, Giant, White	20%
Patent, good quality	10@11%
Patent Russia Sash	14@15%

Samson

Braided, Drab Cotton	42%
Braided, Italian Hemp	40%
Braided, Linen	56%
Braided, White Cotton	37%
Semper Idem, Braided, White	26%

Silver Lake

A quality, Drab, 55¢	25%
A quality, White, 50¢	25%
B quality, Drab, 35¢	10%
B quality, White, 30¢	10%
Sylvan Spring, Extra Braided, Drab	39%
Sylvan Spring, Extra Braided White	34%
Tate's Solid Braided	
Economy, Drab	27%
Economy, White	22%

Heracles, Drab

Heracles, White	25%
White Cotton Braided, fair	23@24%

Wire Picture

Braided or Twisted	80&10@80&20%
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Corkscrews—See Screws, Cork.**Corn Knives and Cutters****Crackers, Nut**

Acme	
Japaned, gr. \$30	50%
Nickel Plated, gr. \$30	30%
Fancy Nickel Plated, gr. \$30	40%
Table (H. & B. Mfg. Co.)	50%
Turner & Seymour Mfg. Co.	50%

Cradles

Grain	50&2@50&5&2%
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Crayons

White Crayons, gr. cross	6@6%
Cases, 100 gr. \$3.75@4.25, at factory	

D. M. Stewart Mfg. Co.

Metal Workers	gr. \$2.50	20@25%
Railroad	gr. \$2.00	20@25%
Rolling Mill	gr. \$2.50	20@25%
Soapstone Pencils	gr. 1.50	20@25%
Stamps	Chalk	

Creamery Pails—See Pails, Creamery**Crow Bars—See Bars, Crow.****Curr Combs****Cutters—Meat**

American						30%
Nos.	1	2	3	4	5	
Each	\$5	\$7	\$10	\$25	\$50	\$60
Enterprise						25%
Nos.	10	12	22	32	42	
Each	\$3	\$2.50	\$4	\$8	\$15	
Dixon's	1 doz.	2	3	4	5	40&10&5%
Nos.	1	2	3	4	5	
Each	\$14.00	\$17.00	\$19.00	\$30.00		

Draw Cut, each

Nos.	5	6	8			20@25%
Each	\$50	\$75	\$80	\$225		

Hale's

Nos.	1	2	3	4	5	70@70&5%
Each	\$27.00	\$32.00	\$38.00	\$45.00		

Home No. 1

1 doz.	\$28.00					55&10%
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Little Giant

1 doz.	\$40.00					40&10&5%
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Nos. 305

1 doz.	\$310					322
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Triumph No. 505

1 doz.	\$21.00					25@30%
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Woodruff's

1 doz.	\$40.00					40&10&5%
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Nos.

1 doz.	\$100					150
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Chadborn's Smoked Beef Cutter

1 doz.	\$15.00					\$18.00
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Enterprise Beef Shavers

1 doz.	\$22.00					\$30.00
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Tucker & Dorsey Mfg. Co.**Kraut Cutters**

1 doz.	\$81.00					\$90.00
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Slaw and Kraut

1 doz.	\$81.00					\$90.00
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Slaw Cutters, 1 Knife

1 doz.	\$81.00					\$90.00
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Slaw Cutters, 2 Knife

1 doz.	\$81.00					\$90.00
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Trabacco

Acme	1 doz. \$20.00					40%
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All Iron

1 doz.	\$4.00					\$4.00
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Champion

1 doz.	\$20.00					20@20&10%
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Nassau Lock Co.'s

1 doz.	\$18.00					50&5%
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National

1 doz.	\$21.00					30%
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Sargent's

1 doz.	\$24.00					60@60&10%
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Washer

Appleton's	1 doz. \$18.00					80&10@80&10&10%
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Bonney's

1 doz.	\$8.50					50&5%
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Cincinnati

1 doz.	\$11.00					25&10%
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Johnson's, Wm.

1 doz.	\$11.00					50%
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Peiny's

1 doz.	\$14					\$14 55%
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Smith's Pat.

1 doz.	\$12.00					20&10@20&10%
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Tum's

1 doz.	\$12.00					25&10%
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Diggers, Post Hole, &c.

Eureka Diggers	1 doz. \$11.00					
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Fletcher Post Hole Augers

1 doz.	\$38.00					20@20&10%
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Gem, Improved

1 doz.	\$8.50					9.00
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Gibbs' Columbia

1 doz.	\$12.00					\$12.00
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Gibbs' Hustler

1 doz.	\$12.00					\$12.00
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Gibbs' Imperial

1 doz.	\$12.00					\$12.00
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Gibbs' National

1 doz.	\$12.00					\$12.00
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Gibbs' Post Hole Digger

1 doz.	\$12.75					\$12.75
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Kohler's Hercules

1 doz.	\$10.00					\$10.00
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Kohler's Invincible

1 doz.	\$10.00					\$10.00
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Kohler's Little Giant

1 doz.	\$15.00					\$15.00
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Kohler's Champion

1 doz.	\$7.50					\$7.50
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Kohler's Pioneer

1 doz.	\$9.00					\$9.00
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Ryan's

1 doz.	\$18.00					\$18.00
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Sampson

1 doz.	\$34.00					25@25&10%
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Universal

1 doz.	\$15.00					\$15.00
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Sewing, Pat. Long 3 doz. \$1.20
Sewing, Pat., Short 3 doz. 45¢@50¢

Halters—

Covert's Adj. Rope Halters 40¢&2¢
Covert's Adj. Rope Halters 35¢&5¢
Covert's Hemp Horse and Cattle Ties 50¢&10¢
Covert's Jute Cattle Ties 70¢&10¢
Covert's Jute Horse Ties 70¢&10¢
Covert's Rope, 7-16 in. Jute 70¢&10¢
Covert's Rope, 1/2 in. Hemp 55¢&10¢
Covert's Rope, Jute 60¢&10¢
Covert's Saddlery Works Halters 33¢&5¢
Covert's Saddlery Works Handy Web Halters 33¢&5¢
Covert's Saddlery Works Horse and Cattle Ties 33¢&5¢

Hammers—**Handled Hammers—**

Atha Tool Co. 50¢&10¢@80¢
Humason & Beckley 50¢&10¢@80¢
Verree 40¢&10¢
Cheney's Claw 40¢&10¢
Cheney's Claw & Riveting 40¢&10¢
C. Hammond & Son 40¢&10¢
Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75 25¢&10¢@40¢
Maydole's, '94 list 25¢&10¢@40¢
Peck, Stow & Wilcox 40¢&10¢
Fayette R. Plumb 40¢&10¢
Artisan's Choice, A. E. Nail 40¢&12¢
Engineers' and B. S. Hand 60¢&15¢
Machinists' Hammers 60¢&10¢
Plain Y. & P. A. E. Nail 40¢&12¢
Other Nail Hammers 50¢&10¢
Sargent's 60¢&10¢
Warner & Noble's new list 25¢&10¢

Heavy Hammers and Sledges—

3 lb and under 30¢&10¢
3 to 5 lb 35¢&10¢
Over 5 lb 40¢&10¢
Wilkinson's Smiths' 10¢&10¢@10¢

Handcuffs and Leg Irons—

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins 40¢
Hampton 45¢&45¢
Ely's Perfection 40¢
Sensible, 3 doz. Pr. \$5.00 60¢

Iron, Wrought or Cast—

Barn Door, 3 doz. \$1.40 20¢&5¢
Bronze Iron Drop Latches 3 doz. 60¢
Sargent's list 50¢&10¢@10¢
Door or Thumb 0 1 2 3 4
Per doz. \$0.90 1.00 1.08 1.95 1.50
Jap'd Store Door Handles—Nuts, \$1.62
Plate, \$1.10; no plate, \$0.88 10¢
Boggin's Latches 3 doz. 28¢@30¢

Wood—

Auger, assorted 3 gr. \$5.00 50¢
Auger, large 3 gr. 7.00 50¢
File, assorted 3 gr. 2.75 50¢
Brad A.W. 3 gr. \$2.00
Apple Firmer Chisel, ass'd 3 gr. 5.00
Apple Firmer Chisel, large 3 gr. 6.00
Hickory Firmer Chisel, ass'd 3 gr. 4.50
Hickory Firmer Chisel, large 3 gr. 5.00
Sockey Firmer Chisel, ass'd 3 gr. 3.00
Sockey Firmer Chisel, large 3 gr. 3.00
Chisel, Fibre Head 3 gr. 3.00
Hammer, Hatchet, Axe, &c. 40¢&10¢
Hoe, Rake, Shovel, &c. 60¢&10¢
Pat. Auger, Douglass 3 set \$1.25
Pat. Auger, Ives 30¢&10¢
Pat. Auger, Swann's 3 set \$1.00
Saw and Plane 40¢&10¢@50¢

Hangers—

Barn Door, New England 70¢&70¢
Barn Door, old patterns 70¢&70¢
Barry 50¢
Best Anti-Friction 60¢&10¢@10¢
Boss 60¢&10¢@10¢
Champion 60¢&10¢
Chicago Anti-Friction 30¢&10¢
Climax Anti-Friction 55¢&55¢
Crescent 60¢&10¢
Cronk's Patent, Steel Covered 60¢&10¢
Duplex (Wood Track) 60¢&10¢
Economy, \$6.00 50¢
Hamilton Wrought Steel Track 50¢
Interstate 60¢&10¢
Kidder's 50¢&50¢
Lane's Parlor 40¢&10¢
Lane's Standard 60¢&10¢@10¢
Lane's Covered 60¢&10¢
Lundy Steel Parlor 50¢&50¢
Magic 60¢&10¢
Matchless 60¢&10¢
Moody 45¢
Moore's Baggage Car Door 33¢
Moore's Elevator 33¢
Moore's Railroad 33¢
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15 40¢&10¢@50¢
Orleans Steel 55¢
Paragon, No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 40¢&10¢
Paragon Parlor 3 set \$2.00
Pendulum, Payson's 40¢&10¢
Perfection 50¢&10¢@10¢
Richards' 30¢&10¢
Samson Steel Anti-Friction 55¢
Star 40¢&10¢@10¢
Stearns' Anti-Friction 20¢&10¢
Stearns' Challenge 25¢&10¢
Sterling 50¢&10¢@10¢
Terry's Ideal 50¢&10¢@10¢
Terry's Modern 50¢&10¢@10¢
Terry's Shield 50¢&10¢@10¢
Terry's Solid 50¢&10¢@10¢
Terry's Wrought Single Strap 50¢&10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00 50¢&10¢
Warner's Pat. 20¢&10¢
Wild West 50¢&10¢
Zenith for Wood Track 55¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.:
Blood's 40 & 10
Hunt's 50¢
Hurd's 50¢
Mann's 50¢
Underhill's 50¢
C. Hammond & Son 10¢
Fayette R. Plumb 10¢
Collins 10¢
Kelly's 50 & 50
P. S. & W. Co. 10¢
Sargent & Co. 10¢
Schulte, Lohoff & Co. 10¢
Ten Eyck Edge Tool Co. 10¢

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Clark's:
Nos. 1, 3, 5, 1888, Old Pattern 75¢&10¢
Nos. 1 and 3, Tip Pattern 75¢&10¢
No. 50, Buffalo Noiseless, 40, 60 and 65 75¢
Buffalo Reversible, Nos. 3, 2, 1, 1, 0, 0, 4 and 5 75¢&10¢
No. 1, Cottage, for wood only 80¢&10¢
No. 1, Diamond, for wood only 80¢&10¢
Dixie L. & P., Nos. 3, 2, 2, 1, 1, 0, 0, 4 and 5 75¢&10¢
No. 25, Empire Reversible 75¢&10¢
Lull & Porter, Nos. 3, 2, 2, 1, 1, 0, 0, 4 and 5 75¢&10¢
Mortise Gravity, Nos. 2, 4, 4, 6, 8, 9 and 10 50¢&10¢
Huffer 50¢&10¢
Parker 50¢&10¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50 75¢&10¢
Reading's Gravity 75¢&10¢
Sargent's, Nos. 1, 3, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 75¢&10¢
Shepard's:
Acme, Lull & Porter, Nos. 3, 2, 2, 1, 1, 0, 0, 4 and 5 75¢&10¢
Buffalo Gravity Locking, Nos. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 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811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019, 1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043, 1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067, 1069, 1071, 1073, 1075, 1077, 1079, 1081, 1083, 1085, 1087, 1089, 1091, 1093, 1095, 1097, 1099, 1101, 1103, 1105, 1107, 1109, 1111, 1113, 1115, 1117, 1119, 1121, 1123, 1125, 1127, 1129, 1131, 1133, 1135, 1137, 1139, 1141, 1143, 1145, 1147, 1149, 1151, 1153, 1155, 1157, 1159, 1161, 1163, 1165, 1167, 1169, 1171, 1173, 1175, 1177, 1179, 1181, 1183, 1185, 1187, 1189, 1191, 1193, 1195, 1197, 1199, 1201, 1203, 1205, 1207, 1209, 1211, 1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235, 1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259, 1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283, 1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307, 1309, 1311, 1313, 1315, 1317, 1319, 1321, 1323, 1325, 1327, 1329, 1331, 1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355, 1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379, 1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403, 1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427, 1429, 1431, 1433, 1435, 1437, 1439, 1441, 1443, 1445, 1447, 1449, 1451, 1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475, 1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499, 1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537, 1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559, 1561, 1563, 1565, 1567, 1569, 1571, 1573, 1575, 1577, 1579, 1581, 1583, 1585, 1587, 1589, 1591, 1593, 1595, 1597, 1599, 1601, 1603, 1605, 1607, 1609, 1611, 1613, 1615, 1617, 1619, 1621, 1623, 1625, 1627, 1629, 1631, 1633, 1635, 1637, 1639, 1641, 1643, 1645, 1647, 1649, 1651, 1653, 1655, 1657, 1659, 1661, 1663, 1665, 1667, 1669, 1671, 1673, 1675, 1677, 1679, 1681, 1683, 1685, 1687, 1689, 1691, 1693, 1695, 1697, 1699, 1701, 1703, 1705, 1707, 1709, 1711, 1713, 1715, 1717, 1719, 1721, 1723, 1725, 1727, 1729, 1731, 1733, 1735, 1737, 1739, 1741, 1743, 1745, 1747, 1749, 1751, 1753, 1755, 1757, 1759, 1761, 1763, 1765, 1767, 1769, 1771, 1773, 1775, 1777, 1779, 1781, 1783, 1785, 1787, 1789, 1791, 1793, 1795, 1797, 1799, 1801, 1803, 1805, 1807, 1809, 1811, 1813, 1815, 1817, 1819, 1821, 1823, 1825, 1827, 1829, 1831, 1833, 1835, 1837, 1839, 1841, 1843, 1845, 1847, 1849, 1851, 1853, 1855, 1857, 1859, 1861, 1863, 1865, 1867, 1869, 1871, 1873, 1875, 1877, 1879, 1881, 1883, 1885, 1887, 1889, 1891, 1893, 1895, 1897, 1899, 1901, 1903, 1905, 1907, 1909, 1911, 1913, 1915, 1917, 1919, 1921, 1923, 1925, 1927, 1929, 1931, 1933, 1935, 1937, 1939, 1941, 1943, 1945, 1947, 1949, 1951, 1953, 1955, 1957, 1959, 1961, 1963, 1965, 1967, 1969, 1971, 1973, 1975, 1977, 1979, 1981, 1983, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, 2021, 2023, 2025, 2027, 2029, 2031, 2033, 2035, 2037, 2039, 2041, 2043, 2045, 2047, 2049, 2051, 2053, 2055, 2057, 2059, 2061, 2063, 2065, 2067, 2069, 2071, 2073, 2075, 2077, 2079, 2081, 2083, 2085, 2087, 2089, 2091, 2093, 2095, 2097, 2099, 2101, 2103, 2105, 2107, 2109, 2111, 2113, 2115, 2117, 2119, 2121, 2123, 2125, 2127, 2129, 2131, 2133, 2135, 2137, 2139, 2141, 2143, 2145, 2147, 2149, 2151, 2153, 2155, 2157, 2159, 2161, 2163, 2165, 2167, 2169, 2171, 2173, 2175, 2177, 2179, 2181, 2183, 2185, 2187, 2189, 2191, 2193, 2195, 2197, 2199, 2201, 2203, 2205, 2207, 2209, 2211, 2213, 2215, 2217, 2219, 2221, 2223, 2225, 2227, 2229, 2231, 2233, 2235, 2237, 2239, 2241, 2243, 2245, 2247, 2249, 2251, 2253, 2255, 2257, 2259, 2261, 2263, 2265, 2267, 2269, 2271, 2273, 2275, 2277, 2279, 2281, 2283, 2285, 2287, 2289, 2291, 2293, 2295, 2297, 2299, 2301, 2303, 2305, 2307, 2309, 2311, 2313, 2315, 2317, 2319, 2321, 2323, 2325, 2327, 2329, 2331, 2333, 2335, 2337, 2339, 2341, 2343, 2345, 2347, 2349, 2351, 2353, 2355, 2357, 2359, 2361, 2363, 2365, 2367, 2369, 2371, 2373, 2375, 2377, 2379, 2381, 2383, 2385, 2387, 2389, 2391, 2393, 2395, 2397, 2399, 2401, 2403, 2405, 2407, 2409, 2411, 2413, 2415, 2417, 2419, 2421, 2423, 2425, 2427, 2429, 2431, 2433, 2435, 2437, 2439, 2441, 2443, 2445, 2447, 2449, 2451, 2453, 2455, 2457, 2459, 2461, 2463, 2465, 2467, 2469, 2471, 2473, 2475, 2477, 2479, 2481, 2483, 2485, 2487, 2489, 2491, 2493, 2495, 2497, 2499, 2501, 2503, 2505, 2507, 2509, 2511, 2513, 2515, 2517, 2519, 2521, 2523, 2525, 2527, 2529, 2531, 2533, 2535, 2537, 2539, 2541, 2543, 2545, 2547, 2549, 2551, 2553, 2555, 2557, 2559, 2561, 2563, 2565, 2567, 2569, 2571, 2573, 2575, 2577, 2579, 2581, 2583, 2585, 2587, 2589, 2591, 2593, 2595, 2597, 2599, 2601, 2603, 2605, 2607, 2609, 2611, 2613, 2615, 2617, 2619, 2621, 2623, 2625, 2627, 2629, 2631, 2633, 2635, 2637, 2639, 2641, 2643, 2645, 2647, 2649, 2651, 2653, 2655, 2657, 2659, 2661, 2663, 2665, 2667, 2669, 2671, 2673, 2675, 2677, 2679, 2681, 2683, 2685, 2687, 2689, 2691, 2693, 2695, 2697, 2699, 2701, 2703, 2705, 2707, 2709, 2711, 2713, 2715, 2717, 2719, 2721, 2723, 2725, 2727, 2729, 2731, 2733, 2735, 2737, 2739, 2741, 2743, 2745, 2747, 2749, 2751, 2753, 2755, 2757, 2759, 2761, 2763, 2765, 2767, 2769, 2771, 2773, 2775, 2777, 2779, 2781, 2783, 2785, 2787, 2789, 2791, 2793, 2795, 2797, 2799, 2801, 2803, 2805, 2807, 2809, 2811, 2813, 2815, 2817, 2819, 2821, 2823, 2825, 282

Plate.....45%
 Romer's Night Latches.....15%
 R. & E. Mfg. Co., list Mar. 20, 1889.....60&10@70%
 Sargent & Co., list July, 1894, 60&10@70%
 Warner's Burglar Proof. # doz.....\$8.00, 50%

Elevator—

Moore's.....39%

Padlocks—

Wrought Iron Padlocks:
 Brittan, Graham & Mathes, list Jan., '94.....75%
 Mallory, Wheeler Co., list Jan. 1, '94.....75%
 Norwich Lock Mfg. Co., list June 10, '91.....50&2%
 Russell & Erwin Mfg. Co., list June 10, '91.....50&2%
 Sargent & Co., list January 1, '94.....75%
 William Wilcox Mfg. Co., list January 1, '94.....75%
 Ames Sword Co., up to No. 103 incl. 50%
 Ames Sword Co. above No. 103.....50&10%
 Barnes Mfg. Co.....40&40&10%
 A. E. Deltz.....40%
 Eureka, Eagle Lock Co.....40&2%
 E. T. Fraim's Keystone Scandinavian 1010 line.....90&50%
 120 line.....90&25%
 109 line.....65%
 510 line.....70&10%
 225, 610 and 209 lines.....50&5%
 All other numbers.....50&5%
 Horseshoe, # doz. \$9.....50&50&10%
 Hotchkiss.....30%
 Nock's.....30%
 Romer's Nos. 0 to 91.....30%
 Romer's Scandinavian, &c., Nos. 100 to 205.....30%
 Scandinavian.....90&50%
 Slaymaker, Barry & Co. No. 1010 line.....90%
 No. 41 line.....40%
 No. 61 line.....60%
 No. 21 line.....70%
 No. 100 line.....90&40%
 Star.....60%

Sash, &c.—

Atwell Mfg. Co.....25&39%
 Champion Safety, list January, 1893.....70&5%
 Clark's No. 1, \$10; No. 2, \$8 # gr.....39%
 Common Sense, Jap'd, Cop. and Brzd.....# gr \$4.00
 Common Sense, Nickel Plated.....# gr \$10.00
 Corbin's Daisy, list Feb. 15, 1886.....70%
 Davis Bronze, Barnes Mfg. Co.....60%
 Ferguson's.....39%
 Fish (Liesch's pat.) No. 100, # gr.....\$5
 No. 105, # gr, \$10.....50%
 Giant, list Jan., 1892.....70&10%
 Hammond's Window Springs, A. 50&10%
 Hammond's Window Springs, B.....50%
 Hugunin's New Sash Locks.....25&5&2%
 Hugunin's Sash Balance.....25&5&2%
 Ives' Patent.....60&10&50&60&10%
 Kempshall's Gravity.....60%
 Kempshall's Model.....60&60&10%
 Monarch.....50%
 Payson's Perfect.....60&10&10%
 Reading.....60%&10&60%&10%
 Security.....30%
 Universal.....30%
 Victor.....60&10&2%
 Walker's.....10%
 Walcott's.....60&10&5%

Lumber, Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....# doz, \$1.75; # gross.....\$17.00

Machines.**Boring—**

Without Augers. Upright. Angular.
 Boss, Carpenters' \$3.50
 Boss, Ship Bldrs.' 3.75
 Douglas.....5.50 \$6.75.....50%
 Jennings.....5.50 6.75.....50&5&2%
 Miller's Falls.....7.50.....25%
 Snell's, Rice's Pat. 5.50 6.75.....40&10&10%

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35%
 Combined Fluter and Sad Iron.....# doz., \$15.00.....30%
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$5.00 each.....35%
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25 each.....30%
 Crown Jewel, 6 in.....\$5.50 each.....35%
 Domestic Fluter.....each, \$1.50
 Eagle, 3 1/2-inch Rolls, \$2.15.....35%
 Eagle, 5 1/2-inch Rolls, \$2.85.....35%
 Knox, 4 1/2-inch Rolls.....\$3.25 each.....35%
 Knox, 6-inch Rolls.....\$3.60 each.....35%

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....20%
 Moore's Hand Hoist, with Lock Brake.....20%
 Moore's Rope Differential Pulley Block.....60%
 Maris & Beck's (Teal Patent).....30%
 See also Blocks.

Washing—

Fair and Square.....# doz \$42.00
 Anthony Wayne, # doz., No. 1, \$42; No. 2, \$36; No. 3, \$42.00.
 Wayne American.....# doz, \$36.00
 Welsell.....# doz, \$36.00
 Western Star, # doz, No. 2, \$36; No. 3, \$39.

Mallets—

B. & L. Block Co., Hickory & L. V. 30&10@40%
 Fibre Head, Stearns.....35%
 Hickory.....20&10@20&10&10%
 Lignum vitae.....20&10@20&10&10%

Mattocks—

Regular list.....60&10&10@70%

Measures—

Standard Fiberware, No. 1, peck # dozen, \$3.50; 1/2 peck, \$3.00.

Meat Cutters—

See Cutters, Meat.

Menders—

Hartness.....# doz., \$1.75
 Hudson's Hose Menders, in set, # doz.....\$6.00
 Hudson's Hose Bands.....# gr., \$1.25

Milk Cans—See Cans, Milk.**Mills—**

Box and Side, list Jan. 1, 1888, 60&10%
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, '93.....20%
 National list, Jan. 1, '94.....30%
 Swift, Lane Bros.....30%
 Wadell's New Box Mills, Ideal Brand, New list.....60&60&10

Mincing Knives—

See Knives, Mincing.

Molasses Cates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Muzzles—

Safety.....# doz, \$3.00, 25%

Nails—

Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association list, May 1, '92, 65&10@90%
 Hungarian, Finishing, Upholsterers, &c. See Tacks.

Nails—

Horae
 Nos. 7 8 9 10
 A. C.....25¢ 23¢ 22¢ 21¢ 21¢
 American.....9% 9% 9% 9% 9% net
 Anchor.....23¢ 21¢ 20¢ 19¢ 15¢.....35%
 Ausable.....23¢ 20¢ 20¢ 22¢ 23¢
 Capewell.....10¢ 18¢ 17¢ 16¢ 10¢ 10¢ 5%
 C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢.....40%
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢
 Clinton Fin.....19¢ 17¢ 16¢ 15¢ 14¢ 30&5%
 Empire Bronzed.....11¢ 11¢ 11¢
 Essex.....28¢ 26¢ 25¢ 24¢ 23¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢ 40&10%
 Lyra.....9% 9% 9% 9% 9% net
 Maud S.....25¢ 23¢ 22¢ 21¢ 21¢
 Northwest'n.....25¢ 23¢ 22¢ 21¢ 20¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢.....15%
 Snowden.....9% 9% 9% 9% 9% net
 Standard.....23¢ 21¢ 20¢ 19¢ 15¢.....35%
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢.....25%
 Western.....23¢ 21¢ 20¢ 19¢ 18¢.....50%

Picture—

Brass Head, Combination list.....50&10%
 Brass Head, Sargent's list.....60&60&10%
 Porcelain Head, Combination list.....40&10%
 Porcelain Head, Sargent's list.....50&10&10%
 Niles' Patent.....40%

Nail Pullers—See Pullers, Nail.**Nail Sets—See Sets, Nail.****Nippers, See Pliers and Nippers.****Nut Crackers—**

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Cold Punched.....5 1/4¢ 5 1/4¢ off list
 Hot Pressed.....6 1/4¢ 6 1/4¢ off list
 In packages of 100 lb, add 1-10¢ # lb, net; in packages less than 100 lb, add 1/4¢ # lb, net.

Oakum—

Best or Government.....# lb 6 @ 6 1/4¢
 Navy.....# lb 5 @ 5 1/4¢
 U. S. Navy.....# lb 5 1/2 @ 5 1/4¢

Oil Tanks—See Tanks, Oil.**Oilers—**

Brass and Copper.....50&10@50&10&5%
 Zinc and Tin.....70&50&75%
 Broughton's Brass.....50%
 Broughton's Zinc.....60%
 Malleable, Hammers' Improved, No. 1, \$6.00; No. 2, \$4.00; No. 3, \$4.40 # doz.....10&5%
 Malleable, Hammers' Old Pattern same list.....50%
 Olmstead's Brass and Copper.....50%
 Olmstead's Tin and Zinc.....60%
 Prior's Pat. or "Paragon" Brass.....60%
 Prior's Pat. or "Paragon" Zinc.....70%
 Steel, Draper & Williams.....60%
 Wilmot & Hobbs Mfg. Co., Steel Anti-Rust.....60%

Openers, Can—

American.....# doz \$2.00 # gross \$1.75@2.00
 Domestic, # doz \$2.00.....50%
 Domestic, # doz \$2.00.....45%
 Duplex.....# doz 25¢, 15¢@20%
 Eureka.....# doz \$2.50, 10%
 Excelsior, No. 1, \$2.50; No. 2, \$1.50.....40%
 French, No. 4.....# doz \$2.25, 55¢@60%
 Iron Handle, No. 5.....# gr \$6.00, 45¢@50%
 Lyman's.....# doz \$3.75, 20%
 Messenger's Comet.....# doz \$3.00, 25%
 Moore's.....75%
 Sardine Scissors.....# doz \$2.75@3.00
 Sprague, Iron or Wood Handles.....# gr \$4.75@5.00
 Star.....# doz \$2.00
 Stricker's.....# doz \$2.00
 Sensible, Japanned, # doz.....80%
 Sensible, Nickel, # doz.....75%
 Surprise, # doz.....25%
 New Sprague, Metallic H'dle, # doz.....50%
 New Sprague, Wood H'dle, # doz.....60%
 Universal, # doz \$3.00.....55&5%
 World's Best # gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50&10%

Packing, Steam—**Rubber—**

Standard, fair quality.....70&10@75%
 Inferior quality.....75&10@80%
 Extra.....60&50@80&10%
 Jenkins' Standard, # lb 80¢.....25&25&5%
 N. Y. B. & P. Co., Double Diamond.....60%
 N. Y. B. & P. Co., Salamander.....45%
 N. Y. B. & P. Co., Carbon.....70&5%
 Miscellaneous—
 American Packing.....# gr @ 10¢ # lb
 Cotton Packing.....14¢ @ 15¢ # lb
 Italian Packing.....12¢ @ 14¢ # lb
 Jute.....6¢ @ 7¢ # lb
 Russia Packing.....13¢ @ 14¢ # lb

Pails—

Creamery—
 S. S. & Co., 18-qt., \$7.00; 20-qt., \$7.25 # doz.....5%

Galvanized Pails—

Light. Heavy.
 10 Quart.....\$2.00@2.25 \$2.25@2.50
 12 Quart.....2.25@2.50 2.50@2.75
 14 Quart.....2.50@2.75 2.75@3.00

Galvanized Buckets—

Fire. Well.
 10 Quart.....\$2.50@2.75
 12 Quart.....2.75@3.00 \$2.75@3.25
 14 Quart.....3.00@3.25 3.00@3.50

Indurated Fiber Ware—

Fire Pails, deep.....# doz \$4.80
 Fire Pails, round bottom.....# doz 5.40
 Milk, 14 qt.....# doz 5.40
 Stable, 14 qt.....# doz 6.00
 Star Pails, 12 qt.....# doz 4.20

Standard Fiber Ware—

Buggy Pails.....\$3.00
 Chamber Pails, 14 qt.....6.00 \$7.00
 Dairy Pails, 14 qt, # doz.....3.75 \$4.25
 Fire Pails, No. 1, 12 qt, # doz.....3.75
 Fire Pails, No. 2, 14 qt, # doz.....4.25
 Horse Pails.....4.00
 Slop Jars (bal. trap).....7.50 \$8.50
 Sugar Pails.....4.75 \$5.25
 Water Pails, 12 qt, # doz.....3.00 \$3.75

Pans—

Dripping—
 Large sizes.....# lb 5¢
 Small sizes.....# lb 5¢
 Silver & Co. (Covered).....40%

Fry—

Standard List:
 # doz \$3.00 3.75 4.25 4.75 5.25
 No.....5 6 7 8
 # doz \$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....75¢@75¢10%
 Acme Fry Pans.....70¢@70¢5%

Dust—

Steel Edge, No. 1.....# doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co., Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each.....60&10%

Paper and Cloth—

Sand and Emery—
 List April 19, 1888.....50&10@60&5%
 Sibley's Emery and Crocus Cloth.....30%

Parers—**Apple—**

Advance.....# doz \$4.50
 Baldwin.....# doz \$5.00
 Bonanza.....each \$5.00
 Daisy.....# doz \$3.50
 Dandy.....each \$7.50
 Eclipse.....# doz \$4.00
 Family Bay State.....# doz \$12.00
 Favorite.....# doz \$5.00
 Gold Medal.....# doz \$4.00
 Ideal.....# doz \$4.00
 Improved Bay State # doz \$27.00@30.00
 Little Star.....# doz \$4.00
 Monarch.....# doz \$13.50
 New Lightning.....# doz \$5.50
 Oriole.....# doz \$4.00
 Penn.....# doz \$3.00
 Perfection.....# doz \$4.00
 Reading 72.....# doz \$4.00
 Reading 75.....# doz \$7.00
 Rocking Table.....# doz \$5.50
 Turn Table.....# doz \$4.50
 Victor.....# doz \$13.50
 Waverly.....# doz \$3.75
 White Mountain.....# doz \$4.00

Potato—

Antrim Combination.....# doz \$5.50
 Saratoga.....# doz \$5.50
 White Mountain.....# doz \$4.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60&10@60&10&70&10%

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—**Bow—**

Humason, Beckley & Co.'s.....70¢@70¢10%
 Peck, Stow & W. Co.....60¢@60¢10&10%
 Sargent & Co.'s \$17 and \$18.....60¢@60¢10&10%

Escutcheon—

Brass.....70%
 Iron, list Nov. 11, '85.....75%

Pipe, Wrought Iron—

List April 13, '93.
 1 1/2 and under, Plain 57 1/2@10&10&10&5%
 1 1/2 and under, Galv.....50¢@10&10&5%
 1 1/2 and over, Plain.....67 1/2@10&10&5%
 1 1/2 and over, Galv.....57 1/2@10&10&5%
 Boiler Tubes, list Oct. 24, '92.....65&10&10&10&5%
 Casing, list Nov. 16, '92.....52 1/2@10&10&10&5%
 Cold Drawn Seamless Steel Tubing.....50%
 Inserted Joints Casing, list Nov. 16, '92.....47 1/2@10&10&5%
 Steel Boiler Tubes.....27 1/2@10&10&5%

Planes and Plane Irons—**Wood Planes—**

Molding.....50&10@50&10&5%
 Bench, First quality.....55&10@55&10&5%
 Bench, Second quality.....60&10@60&10&5%
 Bailey's (Stanley R. & L. Co.).....50&10%
 Iron Planes—
 Bailey's (Stanley R. & L. Co.).....50&10%
 Derby Plane Co.....70%
 Haglin's Iron Planes.....50&10@60%
 Gage Tool Co.'s Self-Setting.....35%
 Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
 Sargent's.....60&10@60&10&5%
 Standard Tool Co.....60&10@60&10%
 Steers' Iron Planes.....50&10@50&10&5%
 Plane Irons—
 Auburn Thistle.....30&10@30&10&10%
 Buck Bros.....30%
 Butcher's.....\$5.00@5.25 to 2
 Ohio.....30&10@30&10&10%
 Sandusky.....30&10@30&10&10%
 Stanley R. & L. Co.....50&10%
 L. & J. White.....25%

Plates—

Fellose.....# lb 6¢@6¢1/2

Pliers and Nippers—

Button's Patent.....60%
 Carew's Pat. Wire Cutters.....20%
 Cronk's Subb's Pat. Pliers.....50%
 Cronk's Button Pat. Pliers.....70%
 Eureka Pliers and Nippers.....40%
 Gas Pliers.....60%
 Gas Pliers, Custar's Nickel Plated, 60&5%
 Hall's Nippers, No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 # doz.....40&10%
 Hall's Pliers.....70%
 Humason & Beckley Mfg. Co. 50¢@50¢10%
 Lindsay's Giant, No. 55, 5 in., # doz.....\$10.50
 Morrill's Parallel, # doz \$12.00.....30&5%
 P. S. & W. Cast Steel.....50¢@50¢5%
 P. S. & W. Thinners' Cutting Nippers, add 6%.....25%
 Russell's Parallel.....25%
 Waterbury Nip's, 5 in., # doz \$7.50, 33¢1/2

Plumbs and Levels—

Regular List.....75&10@80%
 Bishop's.....40&5%
 Davis Inclinator.....10&10%
 Davis Iron Levels.....30%
 Disston's.....50¢@50¢10%
 Pocket Levels.....70&10@70&10&10%
 Stanley's Duplex.....20&10%
 Stanley's Handy.....20&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, # doz, No. 1, \$6.00; No. 2, \$9.00.....33%
 Silver & Co., 8-Ring, # doz, \$3.60; 3-Ring.....\$1.80

Pokes Animal—

Bishop's American.....# doz \$2.50
 Bishop's X. L.....# doz \$2.50
 Bishop's Steel Monarch.....# doz \$4.25
 Bishop's Pioneer.....# doz \$5.25
 Bolding.....# doz \$5.00
 Buckeye Single Stale.....# doz \$2.50
 Columbia, Double Stale.....# doz \$5.00
 Eagle, Double Stale.....# doz \$5.00
 Eagle Single Stale.....# doz \$5.00
 Metallic Horse Poke.....# doz \$5.00

Police Goods—

Daley's Improved Handcuffs, 2 Hands, Polished, # doz, \$4.00; Nickel, \$5.70; 3 hands, Polished, # doz \$7.20; Nickle, \$8.40.....25%
 J. P. Lovell's Police Goods.....25%
 Newhall Ship Chandlery Co. Handcuffs, \$15.00 # doz.....25%
 Tower's.....25%

Polish—**Metal—**

Gaston's Silver Compound.....33¢1/2
 Prestoline.....33¢1/2
 Prestoline Paste.....33¢1/2
 Tanite Mills:
 Paste, 1/4 lb tins.....# gr \$14.40 @ 15
 Paste, 1 lb tins.....# gr \$30.00 @ 30
 Liquid, 1/2 pint.....# gr \$36.00 @ 36
 Powder, 1 lb.....# gr \$36.00 @ 36
 Wynn's White Silk, #pt.cans # doz \$1.57

Stove—

Black Eagle Benzine Paste, 5 and 10 lb cans.....# doz \$10.20
 Black Flag, 5 and 10 lb pails, # lb, 10¢ 25%
 Black Jack Water Paste, 5 and 10 lb cans.....12¢
 Bonnell's Liquid Stove Polish.....# gr \$9.00
 Bonnell's Paste Stove Polish.....# gr \$8.00
 Boynton's Noon Day.....# gr \$13.00
 Crown Paste, 5 and 10 lb pails, # lb, 12¢
 Crown Paste in 5 lb pails.....# gr \$7.20
 Diamond O. K. Enamel.....# gr \$19.00
 Diamond Rock Nickel Cleaner.....# gr \$10.20

Joseph Dixon's, # gr \$6.00.....10%

Covert, New R. E.	60&10&5&24
Fitch's Bristol	50
Fitch's National	50&10&5
Fitch's Clipper	60&10
Fitch's Union	60&10
Fitch's Champion	50
German, new list	40&10
Kelley & Woolworth's Steel Harness	60&10&10

John Protz Snaps	75&75&5
Sargent's Patent Guarded	70&10&10&70&10&10&10

Snaths—

Scythe	60&60&5
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Snips, Tinner's—See Shears.**Soldering Irons—**

See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiber Ware—	
Cuspidors, 3½-inch, # doz. No. 5, 88; No. 52, 89.	

Spittoons, Daisy, 8-inch, No. 1, 4, 10 and 11 inch, 86.	
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Spoke Shaves—

See Shaves, Spoke.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list.	70&25
Buffalo, S. S. Co.	33&25
Solid Table and Trestle	70&25

Silver Plated—

4 months or 5% cash 30 days:	
L. Boardman & Son.	50&12½
Holmes & Edwards Silver Co.	40&15&5
Meriden Brit. Co., Rogers.	40&15
Reed & Barton.	40&40&5
Rogers & Bros.	40&15
C. Rogers & Bros.	40&15
Rogers & Hamilton.	40&15
Wm. Rogers Mfg. Co.	40&15&5
Simpson, Hall, Miller & Co.	40&15&5

Miscellaneous—

Bordman's Britannia Spoons, case lots.	60&5&5 cash
Boardman's Nickel Silver, list July 1.	91
Britannia	60&7&5
German Silver	60&50&5
Nickel Silver	50&5&50&10&5 cash
Holmes & Edwards Silver Co.:	
No. 24 German Silver	50&10&5
No. 30 Silver Metal	50&10&5
No. 49 Nickel Silver	50&10&5
No. 50 Nickel Silver	50&10&5
No. 67 Mexican Silver	50&10&5
Rogers & Hamilton:	
Cimeter, Flatware	40&15&5
Cimeter Steel Goods	40&10
Crown Hamilton, Flatware and Cutlery	30
Steel Goods	40&10
Wm. Rogers Mfg. Co.:	
18% Rogers German Silver	60&6
22% Rogers Nickel Silver	50&6
Rogers' Silver Metal	50&10&6

Spring—Door—

Champion (Coll.)	55&10&55&10&5
Cowell's, No. 1, # doz. \$18.00; No. 2, \$15.00.	
Gem (Coll.) list April 19 '86.	50&50&5
Hercules	50&50&10
Phoenix	33½&39½
Rubber, complete, # doz. \$5.50. 60% 70%	
Star (Coll.) list April 19 '86.	20&10
Torrey's Rod, 39 in. # doz. \$1.20&1.25	
Warner's No. 1, # doz. \$1.50; No. 2, \$3.40.	
Victor (Coll.)	60&10&60&10&5

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scoll.	
60&10&60&10&10&10 or net prices	
Cliff's Bolster Springs	25

Sprinklers, Lawn—

Gibbs' Arc.	# doz. \$12.00
Gibbs' Hustler.	# doz. \$6.00

Squares—

Nickel-Plated	85&85&5
Steel and Iron	
Try Square and T Bevels.	60&10&10
Avery's Bevel Protractor.	50
Avery's Flush Bevel Square.	40
Diston's Try Sq. and T Bevels	50&10&10
Starrett's Micrometer Caliper Sq's res.	25
Winterbottom's Try and Mitre.	30&10

Squeezers—Fodder—

Blair's	# doz. \$2.00
Blair's "Climax"	# doz. \$1.00

Lemon—

Porcelain Lined, No. 1, # doz. \$6.00.	
Wood, Common	# doz. \$1.70&1.75
Wood, No. 2	# doz. \$3.00, 35
Dean's, No. 1, # doz. \$6.50; No. 2, \$5.00.	
Queen	\$1.65; Queen, \$2.50
Dunlap's Improved	# doz. \$2.75, 20&10
Hotchkiss Straight Flash	# doz. \$9.60
Jennings' Star	# doz. \$2.50
King	40&5
Little Giant	50&50&5
The Boss	# doz. \$2.50

Standard Fiber Ware—

See Ware, Standard Fiber

Staples—

Barbed Blind, ¼ in. and larger, # 707½	
Barbed Blind, ¼ in.	# 80&8½
Fence Staples, Galvanized.	Same price
Fence Staples, Plain.	See Trd. Rep.
Grand Crossing Tack Co.'s list.	75&10

Steels, Butchers'—

C. & A. Hoffmann's	40
Nichols Bros.	50
4 & 10&50	

Steelyards**Stocks and Dies—**

Blacksmith's:	
Butterfield's Goods.	35
Waterford Goods.	35
Gardner	25&30
Green River	25&30
Lightning Screw Plate.	25&30
Reece's New Screw Plates.	25&30
Reversible Ratchet.	35

Stone—

Stones, Grind—See Grindstones.

Scythe Stones—

Pike Mfg. Co., list April '92.	33½
Cleveland Stone Co., list Nov. '92.	33½

Oil Stones, &c.

Pike Mfg. Co.	
Hindustan No. 1, # 8	40&40
Sand Stone.	10
Turkey Oil Stone, 4 to 8 in.	80
Turkey Slips.	\$2.00
Lily White Washita.	60
Rosy Red Washita.	60
Washita Stone, Extra.	50
Washita Stone, No. 1.	40
Washita Stone, No. 2.	30
Lily White Slips.	60
Rosy Red Slips.	60
Washita Slips, Extra.	70
Washita Slips, No. 1.	80
Arkansas Stone, No. 1, 3 to 5 in.	\$2.80
Arkansas Stone, No. 15 to 8 in.	\$3.50
Lake Superior.	# 13
Lake Superior Slips.	# 12
Tanite Mills.	# 13
Emery Oil, # doz. \$9.00	50&65

Stops, Bench—

Cincinnati	25&10
Crescent	# doz. \$1.50
Hotchkiss	# doz. \$5. 10&10&10
Hotchkiss, # doz. \$3.	10
Millers Falls.	25
Morrill's, # doz. No. 1, \$10.00; No. 2, \$11.00.	40&20
Stearns'	20&10
Terrill's Nos. 1 and 2, # doz. \$3; No. 3, \$3.60.	
Weston's, No. 1, \$10; No. 2, \$9.25&10&5	

Stove Polish—See Polish, Stove.**Stretchers, Carpet—**

Cast Iron, Steel Points	# doz. 75&80
Cast Steel, Polished	# doz. \$2.25
Socket	# doz. \$1.75
Bullard's	25&10&40

Strops, Razor—

Emerson C. Buff.	# doz. \$2.80&3.00
Imitation Emerson	# doz. \$1.25&1.50
Jordan's Pat. Padded, list Nov. 1, '89.	50
Lamont Combination	# doz. \$4.00

Stuffer, Sausage—

Miles' Challenge, # doz. \$20.	50&50&5
Perry, # doz. No. 1, \$15.00; No. 0, \$21.00.	
Draw Cut No. 4, each \$30.00.	20
Enterprise Mfg. Co., list Jan. 17, '93.	25
Silvers	40&10

Sweepers, Carpet and Lawn—

Acme	# doz. \$26.00
Advance	# doz. \$18.00
Grand	# doz. \$36.00
Gold Medal	# doz. \$27.00
Prize	# doz. \$27.00
Premier	# doz. \$27.00
Superior	# doz. \$27.00
Cosmopolitan	# doz. \$27.00
Furniture Protector, Jap.	# doz. \$24.00
Furniture Protector, Nickel	# doz. \$27.00
Inter Ocean	# doz. \$27.00
Hall	# doz. \$48.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00.	
Domestic, No. 1	# doz. \$21.00
Domestic, No. 2	# doz. \$22.00
Easy Jap'd, # doz. \$22.00; Nickel, \$24.00.	
Excelsior	# doz. \$22.00
Garland	# doz. \$18.00
Liberty	# doz. \$24.00
Grand Rapids, Japanned	# doz. \$24.00
Grand Rapids, Nickel	# doz. \$27.00
Housewife's Delight	# doz. \$15.00
Improved Parlor Queen, Japanned	# doz. \$24.00
Nickel	# doz. \$27.00
Ladies' Friend, No. 2	# doz. \$16.00
Parlor Queen	# doz. \$24.00
Standard	# doz. \$24.00
Supreme	# doz. \$22.00
Bissell Carpet Sweeper Co. make the following rebates:	
\$1.00 # doz. in 5-doz. lots.	
\$2.00 # doz. in 10-doz. lots.	

Lawn—

Thompson Mfg. Co. 30%

Swings—

Davies Lawn 25%

Tacks, Brads, &c.—

List Oct. 19, '89. Old Established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—	
American, Blued	47½
American, Fin'd and Cop'd.	52½
Steel, Bright and Blued	52½
Steel, Tinned and Coppered	52½
Swedes Iron, S. S. Blued	40
Swedes Iron, S. S. Tinned	47½
American Iron Tacks, Domestic	37½
American Iron Tacks, Foreign	50
Swedes Iron Tacks—	
S. S. Blued	37½
S. S. Tinned	42½
Lanc. Blued	30
Lanc. Tinned	37½
Upholsterers', S. S.	47½
Upholsterers', Lanc.	37½
Gimp Tacks—	
S. S. Blued	30
S. S. Tinned	42½
Lanc. Blued	20
Lanc. Tinned	35
Basket and Trimmers' Tacks—	
Lanc.	20
S. S.	30
Hungarian Nails.	30
Common and Patent Brads.	35
Leathered Tacks.	5
Brush Tacks and Nails, S. S.	20
Looking Glass Tacks, S. S.	5
Picture Frame Points, S. S.	12
Lace Tacks Blued	12
Lace Tacks, Tinned	20
Finishing Nails	52½
Trunk and Clout Nails—	
Black	52½
Tinned or Coppered	57½
Basket Nails.	37½
Chair Nails.	35
Clear Box Nails.	30
Tin Capped Nails	50
Shoe Finders' List, Apr. 14, '94.	
F. H. Cobblers' Nails:	
4½-in. and shorter, # 100 lb. \$20.60	
¾ in. and longer, # 100 lb. \$18.85	
C. S. Corrugated Brass Nails, or Flat Head Improved Brass Nails:	
No. 18 and 19 17 & heavier	
2-8 & 2½-8 in. \$80.00	\$41.20
3-8 & 3½-8 in. 51.50	35.15
4-8 longer. 41.20	34.45

Miscellaneous—

Double Point	85&10&85&10&10
Wire Carpet Nails	60&10&60&10&10
Bill Nye Brad Box	\$4.00
Bonnie Blue	# box \$1.50
Claw Handle Carpet	# gr. \$4.00
Home Tacks, No. 50, # case (12 cartons), \$20.00; No. 100, # case (12 cartons), \$72.00.	
Home Nails, No. 200, # case (12 cartons), \$30.00; No. 400, # case (12 cartons), \$80.00.	
Parisian Gilt Nails, cartoon	50
Plymouth Rock Carpet Tacks	20
Upholsterers' Nails	50&10

Wire Brads and Nails—

Steel-Wire Brads, R. & E. Mfg. Co's list	50&10&10
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See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. \$8.70; 60-gal., \$11 each.	
50&10&5	

Tapes, Measuring—

American	40&10&50
Chesterman's, Regular list	30&30&5
Excelsior, Special list	20
Spring	40

Thermometers—

Tin Case	80&80&10
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Thimble Skeins—

See Skeins.

Ties, Bale—Steel

Standard Wire, list	50&10&5
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Tinner's Shears, &c.—

See Shears, Tinner's, &c.

Tinware—

Stamped, Japanned and Piced, list Jan. 20, '87.	70&10&70&25
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Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.**Tobacco Cutters—**

See Cutters, Tobacco.

Tools—Coopers'—

Albertson Mfg. Co.	25
Barton's	20&20&5
Beatty's	33½
Bradley's	20
Sandusky Tool Co.	30&30&5
Shaves, Cincinnati Tool Co.	20
L. & J. White	20&5

Lumber—

Cant Hooks, "Blue Line"	# doz. \$16.00
Cant Hooks, Common Finish	# doz. \$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish	\$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish	# doz. \$14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish	# doz. \$14.00
Cant Hooks, Clip Clasp, Common Finish	# doz. \$12.00
Hand Spikes, # doz., 6 ft., \$15.00; 8 ft., \$20.00.	
Pike Poles, Pike and Hook, # doz., 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.	
Pike Poles, Pike only, # doz., 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.	
Pike Poles, not ironed, # doz., 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00.	
Mall. Iron Socket Peavies, # doz. \$19.00	
Ring Peavies, "Blue Line"	# doz. \$20.00
Ring Peavies, Common	# doz. \$18.00
Steel Socket Peavies	# doz. \$21.00
Settin' Poles, # doz., 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.	
Swamp Hooks	# doz. \$18.00
Champion Steel Socket Peavies—	
per doz.	
Maple Handles, 2½ in. x 4½	\$24.00
to 6 ft.	
Maple Handles, 2½ in. x 4½	26.50
to 6 ft.	
Maple Hndls, 3 in. x 4½ to 6 ft.	29.00
Champion Solid or Split Socket Peavies—	
Maple Handles, 2½ in. x 4½	\$21.00
to 6 ft.	
Maple Handles, 2½ in. x 4½	23.50
to 6 ft.	
Maple Hndls, 3 in. x 4½ to 6 ft.	26.00
Champion Cant Hooks, with steel clasp—	
Maple Handles, 2½ in. x 4, 4½	\$20.00
or 5 ft. handles, 2½ in. x 4, 4½	
or 5 ft. handles, 2½ in. x 4, 4½	21.50
Maple Handles, 3 in. x 4, 4½	23.50
to 5 ft.	
Champion Cant Hooks, with malleable clasp—	
Maple Handles, 2½ in. x 4 to 5 ft. 17.50	
Maple Handles, 2½ in. x 4 to 5 ft. 19.50	
Champion Lug Hooks	28.00
Champion Skidding Tongs	72.00
Champion Swamp Hooks	22.00
Champion Pike Poles, ironed complete, 12 to 20 ft.	45
Cant Hook and Peavy Handles	45

Standard Fiber—

	Per Doz.	Plain. Decorated.
Cuspidors.....	\$7.50	
Half-peck Measure.....	\$3.00	
Peck Measure.....	8.50	
Keelers, 1 1/2 in.....	3.00	
Spittoons, "Daisy" 8 in.....	3.50	4.00
Wash-Basins, 10 1/2 in.....	1.50	2.00
Wash-Basins, 12 in.....	2.00	2.50

See also *Pails*.

Indurated Fiber—

Basins, Ringed, # doz., No. 2.....	1.60
Butter Bowls, 15, 17 and 19-inch (3 pieces), # nest.....	\$1.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), # nest.....	\$2.55
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), # set.....	\$1.20
Spittoons No. 2, # doz.....	\$4.80
Wash-tubs, Nested, Nos. 0, 1, 2, and 3 (4 pieces), # nest.....	\$5.75

See also *Pails*.

Silver Plated Hollow—

Meriden Britannia Co.....	40¢5¢
Read & Barton.....	

Whips—

American Whip Co. Length.	4 ft.	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
I. X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00	22.00	24.00	26.00	28.00
Bull Bone, Half-1/3 Whalebone.....	11.00	12.00	13.00	15.00	16.00	17.00	18.00	20.00
American Standard.....	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	8.00	8.50	9.00
New Name, Stocked Java, Black and Wine Colors.....								
Americus, 93 Pen Whip.....								
Gents' Light Driving No. 111.....								
Gents' Light Driving No. 106.....								
Hand-Made Stocked Java No. 103.....								
A large variety of cheaper grades.....								
Team Whips.....								
Toy Whips.....								
Hardware Assortment 10 American, 75 Whips for \$50.								

Rogers & Brother.....	40¢5¢
Hampson, Hall, Miller & Co.....	
Harford Silver Plate Co.....	
William Rogers Mfg. Co.....	40¢5¢5¢

Washers—

Size hole.....	5-18	3/4	1 1/4	5/8 to 1 3/4
Washers.....	\$4.80	8.30	2.55	2.30

In lots less than 200 lb, # b, add 1/4¢, 5-b boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washer*.

Water Coolers—

See *Coolers, Water*.

Wedges—

Iron.....	# b 2 1/4 @ 2 1/4¢
Steel.....	# b 3 @ 3 1/4¢

Weights, Sash—

Ton lots at factory.....\$14.00@15.00

Small lots at factory.....\$15.00@16.00

Well Buckets, Galvanized—

See *Pails, Galvanized*.

Wheels, Well—

8-in., \$2.00; 10-in., \$2.50; 12-in., \$2.75	
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Wire and Wire Goods—

Market:

Br. # Ann., Nos. 0 to 18.....	75¢10¢80¢
Cop'd, Nos. 0 to 18.....	75¢@75¢10¢5¢
Galv., Nos. 0 to 18.....	70¢10¢75¢
Tin'd, Tin'd list, Nos. 0 to 18.....	75¢@75¢10¢
Stone, Br. and Ann'd.....	82 1/2¢
Nos. 16 to 18.....	82 1/2¢5¢
Nos. 19 to 26.....	82 1/2¢5¢5¢
Nos. 27 to 36.....	82 1/2¢5¢5¢
annealed Wire on Spools.....	60¢
Brass, list April 9, '94.....	40¢5¢
Cast Steel Wire.....	50¢
Copper, list Jan. 18, '94.....	40¢5¢
Galvanized Fence.....	75¢10¢
Mallin's Ann'd & Tin'd on Spools.....	60¢5¢
Mallin's Brass & Cop. on Spools.....	60¢5¢
Steel Music Wire, 12 to 30, imported.....	70¢6¢
Stubs' Steel Wire.....	\$6.00 to \$2.30¢
Tate's Spooled, Tin'd & Ann'd.....	60¢5¢
Tate's Spooled, Cop. and Brass.....	50¢
Tinned Broom Wire, 18 to 21, # b.....	4 1/2¢
Wire Clothes Line, see <i>Lines</i> .	
Wire Picture Cord, see <i>Cord</i> .	

Bright Wire Goods—

Standard list.....90¢@90¢15¢

Wire Cloth and Netting—

Galvanized Wire Netting, 80¢@80¢10¢5¢

Painted Screen Cloth, # 100 ft. \$1.40@1.45

Wire, Barb—See *Trade Report*.Wire Rope—See *Rope, Wire*.

Wrenches—

American Adjustable.....	40¢@40¢10¢
Baxter's.....	60¢@60¢10¢
Cox's Genuine.....	50¢3¢50¢10¢
Cox's Mechanics.....	50¢10¢3¢@80¢
Girard Standard.....	65¢10¢70¢
Lamson & Sessions' Engineers.....	60¢10¢

Lamson & Sessions' Standard.....70¢10¢

Girard Agricultural.....

Lamson & Sessions' Agric'l.....75¢10¢10¢

P. S. & W. Agricultural.....@80¢5¢

W. & B. Diamond.....

Acme, Bright.....50¢50¢10¢

Acme, Nickle.....40¢40¢5¢

Alkan's Pocket (Bright).....\$2.50@2.80

Alligator.....60¢10¢

Always Ready.....33 1/2¢10¢40¢5¢

Bemis & Call's.....

Adjustable S.....35¢5¢

Brigg's Pattern.....30¢10¢

Combination Bright.....40¢10¢

Cylinder or Gas Pipe.....45¢5¢

Extra Heavy.....45¢

Merrick's Pattern.....45¢

No. 3 Pipe, Bright.....55¢

Bit Wrench, Adj., Tatum's.....25¢10¢

doz. \$2.25.....30¢30¢5¢

Boardman's.....25¢10¢

Cincinnati Brace Wrenches.....25¢10¢

Diamond Steel.....55¢3¢

Donohue's Engineer.....20¢10¢

Eagle.....50¢10¢

Hercules.....70¢70¢10¢

Taff's Vice Wrench.....55¢10¢

Tatum's Brace.....25¢10¢

The Favorite Pocket, # doz. \$4.....40¢40¢5¢

Walker's.....55¢3¢

Webster's Pat. Combination.....25¢

Wringers, Clothes—

In lots of less than one dozen.....

Am. Wringer Co.'s list, July 2, '94, 2¢

Colby Wringer Co., list May 1, '94, 2¢

Lovell Mfg. Co., list July 2, '94, 2¢

Peerless M. Co., list Feb. 1, '94, 2¢

National Wringing & Mfg. Co., list June 1, '92.....2¢

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....85¢25¢@90¢

PAINTS, OILS AND COLORS. Wholesale Prices.

White Lead, Zinc, &c.

Lead, Eng. B. B. white.....5 1/4 @ 5 1/2

Lead, Ann. White.....

Dry.....4 @ 4 1/4

In Oil.....5 1/4 @ 5 1/2

Lead, White, in oil, 25 lb tin.....@ 1/2

Lead, White, in oil, 12 1/2 lb tin.....@ 1

pails, add to keg price.....

Lead, White in oil, 1 to 5 lb asorted tins, add to keg price.....@ 2 1/2

Zinc, American, dry.....# b 3 1/2 @ 4 1/2

Zinc, French, Red Seal.....7 @ 7 1/2

Zinc, French, Green Seal.....8 1/4 @ 9

Zinc, French, V. M. X.....6 @ 6 1/2

Zinc, Antwerp, Red Seal.....6 1/2 @ 7 1/2

Zinc, Antwerp, Green Seal.....6 1/2 @ 7 1/2

Zinc, German, L. Z. O.....5 @

Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....10 1/4 @

lots less than 1 ton.....11 @

Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over.....9 1/4 @

lots less than 1 ton.....10 1/4 @

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1¢; 25 bbls. 2¢; 50 bbls. 4¢. No discount allowed on less than bbl. lots.

Dry Colors.

Blue, Celestial.....# b 6 @ 8

Blue, Chinese.....40 @ 60

Blue, Prussian.....25 @ 40

Blue, Ultramarine.....8 @ 25

Brown, Spanish.....# b 1 @ 1

Brown, Vandyke, Amer.....3 @ 3 1/2

Brown, Vandyke, English.....6 @ 8

Carmine, No. 40, in bulk.....\$2.00 @

Carmine, No. 40, in bxs or bbls. 2.10 @

Carmine, No. 40, in ounce bot. 3.00 @

Green, Paris, in bulk.....6 @ 12

Green, Paris, 170 @ 175 lb kegs.....@ 23 1/2

Green, Paris, small pack.....25 @ 29 1/2

REBATES.—3¢ # b on lots of 10,000 lb or over; 2¢ on 4000 to 10,000 lb; 1¢ on 2000 to 4000 lb; 1 1/2¢ on 1000 to 2000 lb; 1¢ on 500 to 1000 lb purchased during the season

Green, Chrome, ordinary.....6 @ 12

Green, Chrome, pure.....22 @ 25

Lead, Red, bbls. and 1/2 bbls.....4 1/2 @ 5

Lead, Red, kegs.....5 @ 5 1/2

Litharge, kegs.....4 1/2 @

Litharge, bbls. and 1/2 bbls.....5 @

Ocher, Rochelle.....1.35 @ 1 1/4

Ocher, French Washed.....1 1/4 @ 2 1/4

Ocher, German Washed.....1 1/4 @ 2 1/4

Ocher, American.....1 1/4 @ 2 1/4

Orange Mineral, English.....7 1/2 @ 8

Orange Mineral, French.....10 @ 10 1/2

Orange Mineral, German.....7 1/2 @ 8

Orange Mineral, American.....7 1/2 @ 8

Red, Indian, English.....5 @ 15

Red, Indian, American.....2 @ 5

Red, Turkey.....9 @ 14

Red, Tuscan.....7 @ 10

Red, Venetian, Amer. # 100 lb.....7 @ 10.00

Red, Venetian, English.....1.10 @ 1.35

Sienna, Italian, Burnt and Powd.....# b 4 @ 5

Sienna, Ital. Burnt, Lumps.....1 1/2 @ 3 1/2

Sienna, Ital., Raw, Powd.....4 1/2 @ 5 1/2

Sienna, Ital., Raw, Lumps.....1 1/2 @ 3 1/2

Sienna, American, Raw.....1 1/2 @ 3 1/2

Sienna, American, Burnt and Powd.....# b 1 1/2 @ 1 1/2

Talc, American.....1 1/2 @ 1 1/2

Terra Alba, French, # 100 lb.....65 @ 75

Terra Alba, English.....65 @ 75

Terra Alba, American No. 1.....65 @ 75

Terra Alba, American No. 2.....45 @ 50

Umber, Turkey, Bnt. & Pow. # 2 1/2 @ 3 1/2

Umber, Turkey, Bnt. Lumps.....2 1/2 @ 3 1/2

Umber, Turkey, Raw, Lumps.....2 1/2 @ 3 1/2

Umber, Turkey, Raw, Amer.....1 1/2 @ 1 1/2

Umber, Turkey, Raw, Amer.....1 1/2 @ 1 1/2

Yellow, Chrome.....10 @ 25

Vermilion, American Lead.....11 @ 12

Vermilion, Quicksilver, bulk.....50 @ 12

Vermilion, Quicksilver, bags.....50 @ 12

Vermilion, Quicksilver, sm'r pkgs. 65 @

Vermilion, English, Import.....60 @ 65

Vermilion, Imitation Eng.....8 @ 90

Vermilion, Trieste.....90 @ 95

Vermilion, Chinese.....85 @ 1.00

Paints in Oil.

Black, Drop, Frankfort.....25 @ 30

Black, Drop, English.....12 @ 15

Black, Drop, Domestic.....7 @ 10

Black, Lampblack, Best.....20 @ 35

Black, Lampblack, Common.....7 @ 13

Black, Ivory.....8 @ 15

Blue, Chinese.....35 @ 40

Blue, Prussian.....20 @ 45

Blue, Ultramarine.....12 @ 13

Brown, Vandyke.....7 @ 12

Green, Chrome.....8 @ 13

Green, Paris.....16 @ 13 1/2

Sienna, Raw.....7 @ 14

Sienna, Burnt.....7 @ 14

Umber, Burnt.....7 @ 10

Umber, Burnt.....7 @ 10

Miscellaneous.

Barytes, Foreign, # ton.....\$22.00@24.00

Barytes, Amer. floated.....28.00@32.00

Barytes, Amer. No. 1.....18.00@18.00

Barytes, Amer. No. 2.....13.00@15.00

Barytes, Amer. No. 3.....11.00@12.00

Chalk, in bulk.....# ton 1.75 @ 2.00

Chalk, in bbls.....# 100 lb 39 @ 40

China Clay, English.....# ton 13.00@18.00

Cobalt, Oxide.....# 100 lb 1.45 @ 1.55

Cobalt, Common.....# 100 lb .40 @ .45

Whiting, Gilders.....50 @ 55

Putty.

In barrels and 1/2 bbls.....1 1/2 @ 1 1/4

In tubs.....1 1/2 @ 1 1/4

In tin cans.....1 1/2 @ 1 1/4

In biads.....1 1/2 @ 2

Spirits Turpentine.

In regular bbls.....@ 28 1/2

In machine bbls.....@ 29

Glue.

Low Grade.....# b 7 @ 9

Cabinet.....11 @ 13

Medium White.....12 @ 14

Extra White.....16 @ 20

French.....10 @ 22

Irish.....10 @ 12 1/2

Animal and Vegetable Oils

Linseed, City, Raw.....# gal. 56 @

Linseed, City, boiled.....59 @

Linseed, Western, raw.....54 @ 55

Lard, City, Extra Winter.....57 @

Lard, City, Prime.....56 @

Lard, City, Extra No. 1.....@ 48

Lard, City, No. 1.....@ 45

Lard, Western, prime.....56 @ 57

Cotton-seed, Crude,

DECEMBER 19, 1894.

IRON AND STEEL

Merchant Steel from Store

Sheet Iron from Store—

Black,

Russia, Plashed, &c.

according to assort-

Galvanized.

Foreign Steel from Store-

METALS—

Tin-

Tin Plates—

Charcoal Plates—Bright—

IX, 14	x 20	6.50
IX, 20	x 28	18.00

Copper—

Ingot—

Sheet and Bolt-

Nos. 20, 21, 22, 23 and 24.....	22	23	26	27	29	31	33	36
Nos. 25 and 26.....	23	24	26	28	30	32	34	37
Nos. 27 and 28.....	23	25	28	30	32	34	36	39

Common High Brass:

Wire in Coils.

1894.

Discount, 40 %.
Spring Wire. 2¢ ~~30~~ in advance.

Copper Belt and Hose Rivets and Burrs—

Tobin

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

Spelter—

Pigs. 14 & 15 m.

500 lb Casks.....	1040
Per lb.....	5140

Lead—

Lead-

Old Lead in exchange, 294¢ @ 10. **Solder—**

Solder—

Antimony—
Free of duty.

Cookson..... 30 lb 9 1/4¢

Free of duty.
.....

No. 1 Aluminum (guaranteed over 98 % pure), in roll-
ing ingots:
 Small lots..... 30 3 63
 100-lb lots..... 20 3 80

.....

Small lots.....	\$	D	60
100-lb lots.....	\$	D	55
Ton lots.....	\$	D	53
No. 2 grade (guaranteed to be over 94 % pure)	Alumi		

.....
 aranteed to be over
 costs for remodeling.

Old Metals—
Dealers' Purchasing Prices Paid in New York.

Purchasing Prices Paid

Lead	38 lb	294
Tea Lead.....	38 lb	256
Zinc.....	38 lb	256
No. 1 Pewter.....	38 lb	100

.....

Stove Plate Scrap \$ gross ton 0.00
Burnt Iron..... \$ gross ton 3.00

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